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Cloud Formation



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[Modeling of Cloud/Radiation Processes for Cirrus Cloud Formation](#) Nov 30, 1997 52 pages

Authors: [K. N. Liou](#); [S. C. Ou](#); [Y. Gu](#); [P. Yang](#); [D. Frankel](#); [CALIFORNIA UNIV LOS ANGELES DEPT OF ATMOSPHERIC SCIENCES](#)

Full Text

This technical report includes five reprints and pre-prints of papers associated with the modeling of cirrus **cloud** and radiation processes as well as remote sensing of **cloud** optical and microphysical properties from an airborne spectrometer based on radiative transfer principles. The time-dependent two-dimensional cirrus model includes a second-order turbulence closure scheme, an advanced interactive radiative transfer scheme, and ice microphysics parameterization. This model is used to understand the physical processes governing the **formation** and evolution of cirrostratus clouds.

[INVESTIGATION OF CRATER GROWTH AND EJECTA CLOUD RESULTING FROM HYPERVELOCITY IMPACT OF ALUMINUM SPHERES ON THICK ALUMINUM TARGETS](#) Jun 1968 133 pages

Authors: [Russell H. Smith](#); [AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH](#)

Full Text

An experimental investigation was conducted of crater growth and ejecta **cloud formation** from the impact of 3.2 mm aluminum spheres on thick aluminum targets at 7 km/sec. Crater growth and transient shape were determined through sequential flash x-rays. Growth followed a decaying exponential ... Relationships between ejecta-cloud parameters and crater diameters were investigated. Cloud-edge motion was determined and an effort made to determine particle origin. Velocities of discrete particles in the **cloud** were determined.

[A Case Study of In-situ-Aircraft Observations in a Waterspout Producing Cloud](#) Mar 2005 55 pages

Authors: [Clayton M. Baskin](#); [NAVAL POSTGRADUATE SCHOOL MONTEREY CA](#)

Full Text

... of in-situ aircraft observations collected in the parent **cloud** of a waterspout is presented. Previous waterspout studies were ... scale down to the individual **cloud** scale. Based upon the analyzed data a hypothetical **formation** process is ... convergent boundaries and thermodynamic processes, internal to the **cloud**, proved to be an essential factor in developing the vertical motion patterns necessary for **formation** of an organized circulation in the shear region and to ... the resultant vortex necessary to account for the waterspout **formation**. This is consistent with conclusions derived from previous studies.

[MESOSCALE ASPECTS OF OROGRAPHIC INFLUENCES ON FLOW AND PRECIPITATION PATTERNS](#) Jun 1967 24 pages

Authors: [Tetsuya Fujita](#); [CHICAGO UNIV IL SATELLITE AND MESOMETEOROLOGY RESEARCH PROJECT](#)

Full Text

Since horizontal dimensions of orography in relation to **cloud formation** and development are mostly in the mesoscale, we usually observe ... mountains during the daytime act as effective high-level heat sources or as **cloud** generators. At night, however, they suppress the **cloud formation** and act as **cloud** dissipators. When these effects are combined with the height of the convective **cloud** base, which could be either higher or lower than that ... systems and precipitation are quite complicated. By using actual cases of **cloud** and precipitation measurements, detailed climatological and mesosynoptic patterns ...

[Experimental and Modeling Studies of Interactions of Marine Aerosols and Clouds](#) May 31, 1997 8 pages

Authors: [Sonia M. Kreidenweis](#); [COLORADO STATE UNIV FORT COLLINS](#)

Full Text

... following key questions regarding marine aerosol/ **cloud** interactions: (1) What factors control the abundance and vertical ... layer? (2) How do these factors affect the **formation** and lifetime of marine clouds? These ... model description of aerosol evolution and aerosol / **cloud** interaction that can be applied to a variety of marine ... model for prediction of the effects of aerosol characteristics on **cloud formation** and evolution, and, in turn, the effects of **cloud** processes on the marine aerosol. The models built ... can be used to study the role of aerosol in **cloud** modification, including ship tracks and ...

[Suppression of Marine Stratocumulus Clouds Due to Reduced Cloud Condensation Nuclei](#) Sep 2000 68 pages

Authors: [Neil T. Smith](#); [NAVAL POSTGRADUATE SCHOOL MONTEREY CA](#)

Full Text

Cloud researchers have documented a variety of processes at work in the **formation** and dissipation of clouds in the marine boundary layer (MBL). **Cloud** rifts occasionally mark a distinct ... in the rift were only 1/6 that observed below the background stratocumulus. **Cloud** droplets in rift clouds were 3-5 microns larger than droplets ... with

the rift and calculations support a drizzle hypothesis for rift **formation** and maintenance. Aerosol losses can be accounted for in drizzle droplets and the disruption of the **cloud** layer evolves in a manner described by Ackerman (1993).

[Development of 2-Dimensional **Cloud Rise** Model to Analyze Initial Nuclear **Cloud Rise**](#)

Mar 2005 109 pages

Authors: [Karson A. Sandman](#); AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF ENGINEERING AND MANAGEMENT

Full Text

... model developed provides a much more detailed definition of the physical properties within the mushroom **cloud** than the 1-D DELFIC option. This is particularly useful in fallout studies on particle **formation**, fractionation, and particle location within the rising/risen **cloud**. The analysis model created for this study is the result of modifications to a convective **cloud** simulation. The primary modification to the convective **cloud** model is the incorporation of initial conditions for a nuclear **cloud** similar to those used in DELFIC's initial conditions module.

[Investigation of Mesoscale Convective **Cloud Clusters** in South China](#)

Nov 3, 1993 26 pages

Authors: [Jixi Jiang](#); [Hujing Ye](#); [Meizhen Chen](#); FOREIGN AEROSPACE SCIENCE AND TECHNOLOGY CENTER WRIGHT-PATTERSON AFB OH

Full Text

The statistical characteristics of 176 mesoscale convective **cloud** clusters in South China, which are classified into three types in terms ... during April-October, 1980-1988. Two composite model charts are presented for their **formation** and development, and two typical cases are studied. Some ... in the surface layer and orographic forcing are the trigger mechanism for the genesis of **cloud** clusters: and (3) Low-level jet and monsoon **cloud** swell are the most important factors for the development of **cloud** clusters ANNOTATION: Investigation of Mesoscale Convective **Cloud Clusters** in South China--Translation ...

[Dynamics of Marine **Cloud Layers: Computer Simulation and Experimental Verification**](#)

Dec 15, 1998 61 pages

Authors: [Joseph Chi](#); DISTRICT OF COLUMBIA UNIV WASHINGTON

Full Text

Goals of this research have been to identify physical processes that determine the dynamics of the marine **cloud** layers and to quantify roles of turbulence, convection and thermal radiation that play in **formation**, dissipation and stability of the marine **cloud** layers. And immediate objectives of the research are to advance turbulence models, use efficient numerical schemes, develop computer simulation programs, simulate the marine **cloud** layers and compare computer results with published experimental data on the marine **cloud** layers so as to yield insights into the **cloud**'s physical processes.

[Dynamics of the Marine **Cloud Layers**](#)

Jul 28, 1999 78 pages

Authors: [Joseph Chi](#); DISTRICT OF COLUMBIA UNIV WASHINGTON

Full Text

... have been to identify physical processes that determine the dynamics of marine **cloud** layers and to quantify roles of turbulence, convection and thermal radiation that play in **formation**. dissipation and stability of the marine **cloud** layers. And immediate objectives of the research are to advance turbulence models, use ... schemes, develop computer simulation programs, simulate the marine **cloud** layers and compare computer results with published experimental ... the marine **cloud** layers so as to yield insights into the **cloud**'s physical processes. For these objectives, two theoretical models. ...

[Modeling of **Cloud/Radiation Processes** for Tropical Anvils](#)

Nov 30, 1992 108 pages

Authors: [Q. Fu](#); [K. N. Liou](#); [S. K. Krueger](#); UTAH UNIV SALT LAKE CITY CENTER FOR ATMOSPHERIC AND REMOTE SOUNDING STUDIES

Full Text

Satellite imagery suggests that large portions of the tropics are covered by extensive cirrus **cloud** systems. Tropical cirrus clouds evolve during the life cycle of the ... in turn would provide an upward flux of water vapor within the **cloud**. The additional moisture at **cloud** top levels would promote rapid ice crystal growth and ... radiative heating rates in typical tropical anvils. The heating rate differences between the **cloud** bottom and top ranges from 30 to 200 K/day. Lilly (1988) has analyzed the dynamic mechanism of the **formation** of cirrus anvils using a mixed layer model, and has shown that ...

[Fuel-Air Explosive Simulation of Far-Field Nuclear Airblasts](#)

Dec 31, 1979 244 pages

Authors: [T. H. Pierce](#); [R. T. Sedgwick](#); S-CUBED LA JOLLA CA

Full Text

... nuclear airblast simulation that is achieved when such FAE clouds are detonated. The **formation** of hemispherical clouds by simultaneous, impulsive liquid fuel injection through a large ... with the atomization and penetration characteristics of large-diameter, impulsively formed single liquid jets are discussed. Small-scale hemispherical **cloud formation** experiments are also discussed. A new reusable facility for testing FAE simulation of nuclear airblasts at the 1/4-ton ... at this scale. Numerical calculations of the airblast that emerges from a detonated heptane-air **cloud** have also been carried out.

[Evolution of a Collection of Bubbles with Application to Wakes, Bubble Screens, and **Cloud Noise**](#)

Aug 1994 476 pages

Authors: [Georges L. Chahine](#); DYNAFLOW INC FULTON MD

Full Text

... ; Viscous Interaction Between Bubble and Line Vortex; The Motion of a Spherical Body Below a Free Surface; Study of Jet Instability **Formation** on Free Surfaces; The Final Stage of the Collapse of a Cavitation Bubble Near a Rigid Walls Study of the Interaction Between a Bubble and a ... Large Bubble/Bubble and Bubble/Flow Interaction; Asymptotic Study of Bubble Dynamics in a Slightly Compressible Flow; Asymptotic Study of Bubble **Cloud** Dynamics in the Proximity of a Body in Potential Flow; Dynamical Interactions in a Bubble **Cloud**; and, Dynamics of the Interaction of Non- Spherical Cavities. (Author)

[Experimental and Modeling Studies of Interactions of Marine Aerosols and Clouds](#)

May 31, 1995

13 pages

Authors: [Sonia M. Kreidenweis](#); [COLORADO STATE UNIV FORT COLLINS](#)**Full Text**

The specific objectives of the modeling component are to develop models of the marine boundary layer, including models that predict **cloud formation** and evolution and the effects of such processes on the marine aerosol (and vice versa). It is anticipated that the modeling techniques built in this project can be used to study the role of aerosol in **cloud** modification, including ship tracks. The objectives of the experimental component are to evaluate new techniques for aerosol characterization and adapt these ...

[Formulation of Subgrid Variability and Boundary-Layer Cloud Cover in Large-Scale](#)

Feb 28, 1999

85 pages

[Models](#)Authors: [M. Ek](#); [L. Mahrt](#); [S. Chang](#); [G. Levy](#); [A. A. Holtslag](#); [OREGON STATE UNIV CORVALLIS COLL OF OCEANIC AND ATMOSPHERIC SCIENCES](#)**Full Text**

... without land-surface/ABL interaction (decoupled mode), then coupled land-surface/ABL simulations where more complicated interactions and feedbacks are possible, including the **formation** and interaction with ABL clouds. (3) The model is used to test how different ocean surface flux forcings interact to determine marine ABL structure and development. (4) The ABL fractional **cloud** cover formulation is updated using a more computationally efficient top-hat distribution of specific humidity rather than the previous Gaussian distribution of relative ...

[Improved Prediction and Characterization of Contrails and Optically-ThinCirrus](#)

Feb 22, 1999

103 pages

Authors: [Andrew J. Heymsfield](#); [Larry Miloshevich](#); [NATIONAL CENTER FOR ATMOSPHERIC RESEARCH BOULDER CO](#)**Full Text**

... F49620-96-C-0024. The aim of this research program has been to improve prediction of aircraft contrail and cirrus **cloud formation**, and to improve understanding of their optical and physical properties. Toward this end, the investigators have used analysis ... distribution of cirrus microphysical and optical properties; (3) Relative humidity conditions for the **formation** of cirrus and contrails; (4) Variability of cirrus microphysical properties; and (5) Improved theory of contrail **formation** Research findings in each of these five categories resulted in at least ...

[Cloud Chemistry of Fallout Formation](#)

Jan 31, 1968

59 pages

Authors: [John H. Norman](#); [Perrin Winchell](#); [Harry G. Staley](#); [GULF GENERAL ATOMIC CO SAN DIEGO CA](#)**Full Text**

... measurements provide some justification for employing diffusion coefficients of fission products in CaO-Al₂O₃-SiO₂ eutectic for the Small Boy calculations. Studies of diffusion coefficients of fission products created in situ in silicate matrices have been initiated. Some preliminary fission-product leaching studies have been made. A program for studying the leaching of recoiled fission products from silicates is outlined. Mass spectrometric Knudsen cell studies have demonstrated the apparent importance of such species as CeO₂(g), PrO₂(g), NdO₂(g), and TcO₃(g) to fallout **formation** processes.

[Research in Numerical Analysis Techniques for Fog Model Simulation.](#)

Nov 15, 1971

48 pages

Authors: [Russell C. Serbagi](#); [DIGITAL PROGRAMMING SERVICES INC WALTHAM MASS](#)**Full Text**

... given for the numerical solution of the partial differential equations governing the transport and condensation processes of clouds. The models considered include two dimensional warm fog seeding, one dimensional cumulus **cloud formation**, and three dimensional warm fog modification by external heat sources. The finite difference techniques used and the stability criteria are discussed. A series of computer programs, data reduction techniques, and ...

[Assessment of the NASA Evolve Long-Term Orbital Debris Evolution Model](#)

Feb 1995

159 pages

Authors: [K. W. Yates](#); [F. M. Jonas](#); [ORION INTERNATIONAL TECHNOLOGIES INC ALBUQUERQUE NM](#)**Full Text**

... as a function of fragment size, altitude, and time. Launched intact objects, introduced from detailed manifest databases, are time-evolved with an analytical orbit propagator. Debris clouds, formed from the application of **cloud formation** algorithm and breakup model, are time-evolved using a derived phenomenological function. This report describes the overall computer model (e.g., its deterministic and stochastic modes of calculation) and examines the individual submodels ...

[CFD of Complex Three-Dimensional Multiphase Flowfields](#)

Jan 2002

89 pages

Authors: [E. R. Perrell](#); [N. A. Tonello](#); [A. Hosangadi](#); [N. Sinha](#); [S. M. Dash](#); [COMBUSTION RESEARCH AND FLOW TECHNOLOGY INC DUBLIN PA](#)**Full Text**

... post-hit C/B aerodynamic breakup scenarios with an emphasis on bulk liquid payloads. A detailed flyout and aero-breakup study of a high-speed blob is presented, showing the full dynamics from blob flyout to droplet wake **cloud formation**. Neutralization of droplet clouds by conventional chemical explosive mechanisms was investigated. Marked sensitivities were found to the droplet sizes and timing of the explosion relative to the clouds trajectory. Thus, the possibility ...

[Estimation of Atmospheric Precipitable Water Using the Global Positioning System](#)

Mar 2002

119 pages

Authors: [David A. Garay](#); [AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF ENGINEERING AND MANAGEMENT](#)**Full Text**

... forecasting. Traditional methodologies for measuring atmospheric water vapor distributions have known inadequacies, resulting in the motivation to gain good water vapor characterization via GPS. The ability to accurately forecast **cloud formation** and other weather phenomenon is critical, especially in the case of military operations. Using a network of GPS receivers, it is possible to estimate precipitable water throughout the network region with better ...

[The NRL Mountain Wave Forecast Model \(MWFM\) \[Preprint\]](#)

Jun 17, 2004 21 pages

Authors: [Stephen D. Eckermann](#); [Jun Ma](#); [Dave Broutman](#); [NAVAL RESEARCH LAB WASHINGTON DC E O HULBURT CENTER FOR SPACE RESEARCH](#)**Full Text**

... and has been continuously maintained and significantly upgraded at NRL over that time: the upgrades have both significantly improved the stratospheric CAT forecasts, and yielded new forecast products such as mountain wave-induced **cloud formation** potential and upper tropospheric mountain wave CAT. Our focus in this paper is to provide a general introductory overview of the MWFM, focusing less on the mathematical details and more on its current status ...

[Annual Technical Report for Contract N00014-91-J-4017 \(South Dakota School of Mines and Technology\)](#)

Sep 30, 1992 8 pages

Authors: [SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY RAPID CITY INST OF ATMOSPHERIC SCIENCES](#)**Full Text**

... , stratocumulus, and cumulus clouds in the marine boundary layer. This will include the **formation**, evolution, and dissolution of the clouds and the area covered by the **cloud** fields. If a large enough domain can be covered, then the change from one type of **cloud** to another would be investigated. Also the change from open cell to closed cell type convection and the **formation of cloud** streets could be investigated. Another objective is to What determines the vertical profiles of humidity, temperature, and **cloud** characteristics in space and time? What causes the changing depth ...

[Numerical Simulation of Cirrus Clouds - Fire Case Study and Sensitivity Analysis](#)

Aug 12, 1991 142 pages

Authors: [Scot T. Heckman](#); [COLORADO STATE UNIV FORT COLLINS DEPT OF ATMOSPHERIC SCIENCE](#)**Full Text**

... agreement between observed and model predicted dynamic and **cloud** fields. We verified **cloud** height, thickness, areal extent and microphysical composition against GOES satellite imagery ... cirrus lifecycle is examined to determine possible **formation**, maintenance and dissipation mechanisms. Sensitivity ... was run with no condensate to examine **cloud** feedbacks on the environment. **Cloud** top generation zones, ... activity in the lower layer thereby increasing its optical depth. **Cloud** top cooling and ... base heating affected the flow around the **cloud**. Secondly, the effects of three upper boundary ...

[The Numerical Simulation of Marine Boundary Layer Clouds](#)

1993 3 pages

Authors: [Harold D. Orville](#); [SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY RAPID CITY](#)**Full Text**

... stratus, stratocumulus, and cumulus clouds in the marine boundary layer. This included the **formation**, evolution, and dissolution of the clouds and the area covered, then the change from one type convection and the **formation of cloud** streets could be investigated. Another objective is to increase our ... layer. What determines the vertical profiles of humidity, temperature, and **cloud** characteristics in space and time? What causes the changing depth of the ... indicate ways to improve the model and whether practical predictive **cloud** models for the marine boundary layer can be constructed

[Development and Evolution of Cirrus in a Mesoscale Model](#)

Mar 2006 79 pages

Authors: [Michael M. Lewis](#); [NAVAL POSTGRADUATE SCHOOL MONTEREY CA DEPT OF METEOROLOGY](#)**Full Text**

Cirrus **cloud** forecasting is of particular importance to various Department of Defense programs. This thesis takes a case study approach to study Air Force Weather Agency Mesoscale Model 5 (AFWA MM5) ... ice water content, vertical velocity, and other fields are considered to determine if the model possesses the proper dynamical factors for cirrus **formation**. Finally, model coverage of ice **cloud** is compared to the ABL **cloud** mask results to determine how well the model's ice **cloud** forecasts verify against each 3-hourly observed ice water field taken from the GOES data. Results indicate that the MM5 ...

[MISERS BLUFF Electromagnetic Propagation Experiments. Final Analysis of the Laser Experiment Data](#)

Oct 1, 1980 49 pages

Authors: [Arne Rosengreen](#); [Alan A. Burns](#); [SRI INTERNATIONAL MENLO PARK CA](#)**Full Text**

... for final reduction, was of limited use because of the unexpected nature of the **cloud** echoes. The 2.5-MHz receiver bandwidth provided insufficient resolution for the signals that ... region that extended at most only a few tens of meters into the **cloud**. For the most part, laser signals did not penetrate very deeply into the **cloud**. Average values for the volume backscattering coefficient have been calculated for the ... general, the results show that lidar measurements provide little information about the **formation** of dust clouds as dense as that present at MBII-2. These measurements suggest that dust ...

[Helicopter Icing Spray System \(HISS\) Evaluation and Improvement](#)

Apr 1986 156 pages

Authors: [Daumants Belte](#); [Ralph Woratschek](#); [ARMY AVIATION ENGINEERING FLIGHT ACTIVITY EDWARDS AFB CA](#)**Full Text**

... qualification tests in artificial icing conditions. The operational performance and spray **cloud** characteristics of the Helicopter Icing Spray System were evaluated in the course ... freezing, and non-uniform flow patterns from the boom assembly. In-flight spray **cloud** data taken with a JU-21A aircraft using particle measuring spectrometers found ... normally found in natural stratiform clouds. Many aspects of ice **formation** produced on various test aircraft compared favorably to natural accretions. Ability of the artificial **cloud** to produce non-streamlined 'double-horn' ice shapes on main rotor blades ...

[Fuels Combustion Research](#)

Oct 31, 1987 37 pages

Authors: [Frederick L. Dryer](#); [Irvin Glassman](#); [Forman A. Williams](#); [PRINCETON UNIV NJ DEPT OF MECHANICAL AND AEROSPACE ENGINEERING](#)

After studying soot **formation** in normal diffusion flames, near and slightly sooting ... investigated to determine the key intermediates to soot **formation**. The results indirectly confirm that the initial number ... particles which

form scale with aromatic **formation** just prior to soot inception. Correlations ... height experiment and the extent of aromatic **formation** measured in both inverse and normal ... strongly support the previously proposed hypothesis of the **formation** of the impermeable shell and subsequent disruption Keywords: Born slurry combustion; Boron **cloud** combustion; Slurry fuels; Jet engine ...

[Full Text](#)

[Foam Generation and Air Entrainment Near a Free Surface](#)

Sep 30, 1987 37 pages

Authors: [D. W. Hubbard](#); [O. M. Griffin](#); [R. D. Peltzer](#); [NAVAL RESEARCH LAB WASHINGTON DC](#)

[Full Text](#)

The flow in a breaking wave is a type of agitation which is conducive to foam **formation**. The downstream wake of a surface vessel in the seaway also is characterized by a layer of foamy, agitated water near the surface, and a subsurface layer bubbles or a bubble **cloud**. The purpose of this report is to discuss the basic features of foam and bubble **formation**, and air entrainment as these features are known at the present time. We shall ... relating these basic features to the processes of deep water wave breaking and of wake **formation** and development for surface ships moving in the seaway.

['Studies of Marine Aerosols and Their Evolution in the Eastern North Atlantic and Analysis of MAST Data'](#)

Oct 15, 1996 6 pages

Authors: [Peter V. Hobbs](#); [UNIV OF WASHINGTON SEATTLE DEPT OF ATMOSPHERIC SCIENCES](#)

[Full Text](#)

As part of the Monterey Area Ship Track (MAST) Study, the University of Washington's **Cloud** and Aerosol Research Group used its integrated airborne research facility to obtain in situ measurements of the particles and gases emitted ... evolution of these effluents downwind, and their effects on the microstructure and optical properties of marine stratiform clouds, particularly as they affect the **formation** of so-called 'ship tracks' in clouds. The results of these studies confirmed that it is the effluents from ships that produce 'ship tracks' under appropriate **cloud** and meteorological conditions.

[Determining Entrainment Rate and the Role of Entrainment in Stratocumulus Clouds](#)

Jun 1999 78 pages

Authors: [David W. McDowell](#); [NAVAL POSTGRADUATE SCHOOL MONTEREY CA](#)

[Full Text](#)

... the boundary layer is found very complex and consists of a layered structure located in the first few hundred meters above the **cloud** top. These layers are 20-130 meters deep and possess properties that relate the layers to boundary layer processes. A conceptual model is presented to explain the **formation** of these layers. The added presence of the layered structure above the **cloud** top complicates the determination of jump conditions and thus the calculation of entrainment velocity. In addition, jumps in conserved quantities vary ...

[Measurement and Prediction of Particulate Concentration Within External and Internal Flows](#)

Oct 1997 98 pages

Authors: [Lisle H. Russell](#); [Philip M. Bushong](#); [Robert E. Richardson](#); [NAVAL SURFACE WARFARE CENTER DAHLGREN DIV VA](#)

[Full Text](#)

The focus of this report is the **formation**, growth, and transport of airborne particulate clouds within the boundary layer atmosphere as well as the interaction of ... plumes. Predictions were also made of internal room contamination caused by the ingestion of a particulate **cloud** by a notional, ventilated building. This analysis employed the Ship Chemical Warfare Vulnerability Ventilation Model (... , exposure, and deposition histories were calculated and graphically rendered for the mmw obscurant **cloud**. Parameters that significantly impact the TDR predictions for these quantities were varied as part ...

[A Critical Ionization Velocity Experiment on the ARGOS Satellite](#)

Jan 2007 11 pages

Authors: [Shu T. Lai](#); [Ingemar Haggstrom](#); [Gudmund Wannberg](#); [Assar Westman](#); [William J. McNeil](#); [David Cooke](#); [Lawrence Wright](#); [Keith Groves](#); [Asta Pellinen-Wannberg](#); [AIR FORCE RESEARCH LAB HANSCOM AFB MA SPACE VEHICLES DIRECTORATE](#)

[Full Text](#)

... This was intended to induce ionization through the critical ionization velocity (CIV) process proposed by Alfvén in his theory of the **formation** of the planets in the solar system. If the CIV process had been operational and efficient, ionization of the xenon **cloud** might have been observed. Radar observations by EISCAT showed no detectable enhancement of the ambient plasma in the ... which predicts that the overall yield of xenon ions in the release would be low, owing merely to the initially high density of the rapidly expanding xenon **cloud**.

[LWS Observations of the Colliding Galaxies NGC 4038/39](#)

1996 5 pages

Authors: [J. Fischer](#); [L. M. Shier](#); [M. L. Luhman](#); [S. Satyapal](#); [H. A. Smith](#); [G. J. Stacey](#); [S. J. Unger](#); [M. A. Greenhouse](#); [L. Spinoglio](#); [M. A. Malkan](#); [NAVAL RESEARCH LAB WASHINGTON DC REMOTE SENSING DIV](#)

[Full Text](#)

Infrared Space Observatory (ISO) Long Wavelength Spectrometer (LWS) and ground-based Fabry-Perot imaging spectroscopic observations are used to penetrate the extinction to the powerful burst of star **formation** that has occurred in the extranuclear molecular **cloud** complex in the galaxy overlap region of the galaxies NGC 4038/39 ("The Antennae"). Parameters of the starburst and typical molecular **cloud** core characteristics are derived. It is found that the starburst can power the infrared luminosity of this galaxy system.

[CLOUD CHEMISTRY OF FALLOUT FORMATION](#)

Jan 31, 1969 64 pages

Authors: [John H. Norman](#); [Perrin Winchell](#); [Harry G. Staley](#); [GULF GENERAL ATOMIC CO SAN DIEGO CA](#)

[Full Text](#)

Studies of fission-product gamma emanation shortly after fission (1 to 100 sec) have been initiated. The half-lives that will be established in this program, when used in conjunction with initial yields, will provide the fission-product yield history for calculational models. The studies undertaken include (1) an investigation of the transitive behavior of fission products from approximately 1 sec after fission, (2) experiments to establish recoil range as a parameter to use for identifying the sources of specific gamma rays, and (3) design of a steady-state tape system for catching and ...

[Shiptrack Detection Algorithm Study](#)

Jun 1992

104 pages

Authors: [Vincent F. Giampaolo](#); [NAVAL POSTGRADUATE SCHOOL MONTEREY CA](#)

Shiptracks are known to be a relatively common phenomenon, often appearing in AVHRR channel 3 imagery as anomalous, curvilinear **cloud** lines. Despite their significance to remote ship surveillance studies, the **formation** mechanisms responsible for shiptrack production are still largely unknown and their specific characteristics still undefined. A shiptrack detection algorithm being developed at the Naval Postgraduate School seeks to objectively detect and locate shiptracks on AVHRR ...

[Full Text](#)[The Initiation of Lightning and the Growth of Electric Fields in Thunderstorms](#)

Dec 1993

60 pages

Authors: [John Latham](#); [UNIVERSITY OF MANCHESTER INST OF SCIENCE AND TECHNOLOGY \(UNITED KINGDOM\) DEPT OF PHYSICS](#)

Further research into the glaciation of convective clouds of-the type that produce lightning has revealed that the early stages of ice **formation** can be detected by measurement of the supercooled droplet radius - a result which also has climatological implications. Further laboratory experiments have shown that the most effective methods of ... A new model of thundercloud electrification and lightning production has been developed, from which it is possible to deduce the sensitivity of lightning frequency to meteorological and **cloud** microphysical parameters. Lightning, Ice, Corona, Electric field.

[Full Text](#)[Applications of Spectral Microwave Radiometry to Sensing of Sea Ice and the Ocean Surface](#)

May 1993

106 pages

Authors: [Karen M. St Germain](#); [MASSACHUSETTS UNIV AMHERST DEPT OF ELECTRICAL AND COMPUTER ENGINEERING](#)

... constant of new sea ice, as measured with a spectral C-Band radiometer, is approximately 12. This value represents the early stages of ice **formation**, and decreases rapidly with ice growth to approach the accepted value of 3.2 for first year ice. Atmospheric effects on satellite based passive ... were also examined with regard to the 19, 22, 37, and 85 GHz channels of the SSM/I system. The atmospheric vapor and **cloud** liquid water attenuation was empirically modeled with respect to frequency and atmospheric temperature. The mean atmospheric temperature was empirically linked to surface temperature ...

[Full Text](#)[Mid-Level Vorticity in Mesoscale Convective Systems](#)

May 8, 1996

100 pages

Authors: [Ronnie G. King](#); [AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH](#)

... Complexes (MCCs) using the Central Plains Wind Profiler Demonstration Network (WPDN). Nine MCCs from the summer of 1993 were picked for this study based on their **formation** and lifetime spent over the WPDN. Bartels and Maddox's (1991) climatological study of MCVs for 1981 - 1988 estimated that less than 5% of MCCs exhibit a vortex whose clouds persist long enough after the dissipation of the MCCs high-level obscuring cirrus **cloud** to become apparent in visible satellite imagery. This low estimate of MCVs in MCCs leads to the question of how many MCCs produce MCVs. Some ...

[Full Text](#)[Aerosol Physicochemistry at Christmas Island: Links to the Oceanic Sulfur Cycle](#)

Feb 24, 1997

9 pages

Authors: [Antony D. Clarke](#); [HAWAII UNIV HONOLULU DEPT OF OCEANOGRAPHY](#)

... research for many years. We have demonstrated for the first time that diurnal processes in the marine boundary layer related to both aerosol **formation** and transformation can be observed in the dynamic response of the aerosol size distribution. We were able to show that new particle production was ... existing aerosol. We also demonstrated that subsidence (as evidence by ozone variability) contributed new nuclei into the boundary layer from aloft and that **cloud** processing and heterogeneous chemistry 'grew' them to larger sizes. This process was shown to be modulated by diurnal photochemistry. We ...

[Full Text](#)[Coupled Ocean-Atmosphere Interaction and the Development of the Marine Atmospheric Boundary Layer](#)

Oct 7, 1997

9 pages

Authors: [David P. Rogers](#); [SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA CA](#)

... , we focussed on understanding the processes that control the exchange of heat and moisture between the ocean and the atmosphere and understanding the physical processes that control the **formation**, development and decay of stratocumulus clouds in the marine boundary layer. These results have led to new insight into the interactions between cumulus and stratocumulus clouds ... information on the temperature of the sea surface is required. Generally, coupled models fail to resolve accurately the sea surface temperature because they do not include the **cloud** processes addressed in the present study.

[Full Text](#)[Microwave Observations of Mesoscale Convective Systems During Tropical Cyclone Genesis in the Western North Pacific](#)

Mar 1998

106 pages

Authors: [David Milot](#); [NAVAL POSTGRADUATE SCHOOL MONTEREY CA](#)

... of the role mesoscale convective systems (MCS) play in the genesis stages of tropical cyclones will increase the ability to predict their **formation**. This thesis employs polar-orbiter microwave and geostationary infrared satellite imagery to document MCS structure and evolution during tropical cyclone genesis. Microwave imagery at frequencies of 19.35 GHz and 85.5 GHz are used to define convective and stratiform **cloud** areal amounts, percent coverage, and time-integrated rain rates. Collocations with geostationary infrared images are used to calibrate that imagery so ...

[Full Text](#)[NOPP Aerosol Process Experiments: Phase 2 Data Report](#)

Sep 23, 1999

77 pages

Authors: [William F. Sullivan](#); [Thomas M. Albrechtski](#); [Robert R. Ambrusko](#); [CALSPAN UB RESEARCH CENTER BUFFALO NY](#)

... of Washington, and with the participating scientists from the National Center for Atmospheric Research,

Full Text

Aerodyne, Environment Canada and the University of Delaware. CUBRC was responsible for the measurement of liquid water content during **cloud** processing experiments and hydrocarbons (HC's) in experiments designed to study aerosol **formation** and nucleation in the presence of HC's.

Total Results: 44

Results per page:
100

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