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20040012770 NASA Ames Research Center, Moffett Field, CA, USA
Spectral Models of Kuiper Belt Objects and Centaurs
Cruikshank, Dale; Ore, Christina M. Dalle; September 29, 2003; 14 pp.; In English
Contract(s)/Grant(s): RTOP 344-32-20-01
Report No.(s): RTOP 344-32-20-01; No Copyright; Avail: CASI; A03, Hardcopy

We present models of the spectral reflectances of groups of outer Solar System objects defined primarily by their colors in the spectral region 0.4 -1.2 microns, and which have geometric albedo 0.04 at wavelength 0.55 microns. Our models of the groups with the strongest reflectance gradients (reddest colors) use combinations of organic tholins. We test the hypothesis that metal-reddened igneous rock-forming minerals contribute to the red colors of Centaurs and KBOs by using the space-weathered lunar soil as one of the components of our models. We find that our models can admit the presence of moderate amounts of space-weathered (metal-reddened) minerals, but that they do not require this material to achieve the red colors of the reddest outer Solar System bodies. Our models with organic tholins are consistent with the results of other investigators.
Author
Kuiper Belt; Solar System; Spectral Bands; Spectral Reflectance; Mathematical Models; Asteroids

20040031429 Research and Technology Organization, Neuilly-sur-Seine, France
Simulation of and for Military Decision Making
June 2003; 168 pp.; In English; Simulation of and for Military Decision Making, 15-16 Oct. 2001, Rome, Italy; See also 20040031430 - 20040031444; Original contains color illustrations
Report No.(s): RTO-EN-017; AC/323(SAS-032)TP/26; Copyright; Avail: CASI; C01, CD-ROM; A08, Hardcopy

Modelling and Simulation (M&S) can be used as a tool to support the development and operational use of new military concepts and systems for the future. M&S also help to better train and use existing forces and equipment and to improve operations in the new environment. The simulation of the Military Decision Process is a critical part in the use of M&S for this purpose. Computer Generated Forces (CGF) and Human Behaviour Representation (HBR) can be used as a tool to support the development and operational use of new concepts and systems for the future. They also help to better train and use existing forces and equipment and to improve operations in the new environment. Emerging technologies will have a great impact on the implementation and on the military use of such CGF and HBR in the future. It offers support in different application areas; examples are thinking automated opposing forces (training and exercise), closed simulation systems (defence planning), Decision Support Tools (support to operations), and virtual environments (acquisition). The use of such systems will have great military implications and will save money and personnel in the future. The aim of this Lecture Series is to provide an overview on the use of M&S of the Military Decision Process in

the different application areas of training and exercising, support to operations, analysis and acquisition, and to provide a review of the state-of-the-art in the respective areas.
Author
Military Operations; Computerized Simulation; Command and Control

20040034754 NASA Goddard Space Flight Center, Greenbelt, MD, USA
Abundance of the Radioactive Be-10 in the Cosmic Radiation up to 2 GeVnucleon-l with the Balloon-borne Instrument ISOMAX1998
Hams, T.; Barbier, L. M.; Bremerich, M.; Christian, E. R.; deNolfo, G. A.; Geier, S.; Goebel, H.; Gupta, S. K.; Hof, M.; Menn, W., et al.; [2004]; 1 pp.; In English
Report No.(s): RTOP 353-87-02; No Copyright; Avail: Other Sources; Abstract Only

The Isotope Magnet Experiment (ISOMAX) a balloon-borne superconducting magnet spectrometer was designed to measure the isotopic composition of the light isotopes (3 less than or equal to Z less than or equal to 8) of the cosmic radiation up to 4 GeV nucleon (exp -1) with a mass resolution of better than 0.25 amu by using the velocity vs. rigidity technique. To achieve this stringent mass resolution ISOMAX was comprised of three major detector systems, a magnetic rigidity spectrometer with a precision drift chamber tracker in conjunction with a three-layer time-of-flight system and two silica-aerogel Cherenkov counters for the velocity determination. A special emphasis of the ISOMAX program was the accurate measurement of radioactive Be-10 with respect to its stable neighbor isotope Be-9, which provides important constraints on the age of cosmic rays in the Galaxy. ISOMAX had its first balloon flight on August 4-5, 1998, from Lynn Lake, Manitoba, Canada. Thirteen hours of data were recorded during this flight at a residual atmosphere of less than 5 g per square centimeter. The isotopic ratio at the top of the atmosphere for Be-10/Be-9 was measured to be 0.195 plus or minus 0.036 (statistical) plus or minus 0.039 (systematic) between 0.26 - 1.03GeV nucleon (exp -1) and 0.317 plus or minus 0.109 (statistical) plus or minus 0.042 (systematic) between 1.13 - 2.03GeV nucleon(exp -1). This is the first measurement of its kind above 1 GeV nucleon (exp -1). ISOMAX results tend to be higher than predictions from current propagation models.
Author
Beryllium Isotopes; Abundance; Balloon-Borne Instruments; Nucleons; Superconducting Magnets; Spectrometers; Cosmic Rays

20040040091 Research and Technology Organization, Neuilly-sur-Seine, France
Optical Air Flow Measurements in Flight
December 2003; 106 pp.; In English
Report No.(s): RTO-AG-160-Vol-20; AC/323(SCI-033)TP/48-Vol-20; Copyright; Avail: CASI; A06, Hardcopy

Providing an introductory practical overview of in-flight optical flow measurement techniques is the goal of this AGARDograph. This document is written for instrumentation engineer or research scientist having a need for making non-intrusive flow measurements on an aircraft. It is hoped that this document will be particularly useful for the technologist with a limited background in optical theory and limited experience in applying optical technology. The experience of the authors and well as numerous other workers has been infused to provide guidance to avoid expensive non-productive diversions that may occur when applying optical technology for the first time in the flight environment. This AGARDograph provides basic knowledge and techniques necessary to assess the applicability of optical measurements and to address effective optical measurement techniques in flight. Key aspects of optical measurements are discussed and the tradeoffs are identified as they are currently understood. Basic components of optical measurement systems are discussed and key requirements are identified. Specific systems designed for a variety of applications are discussed to provide insight for the reader.
Author
Air Flow; Flow Measurement; In-Flight Monitoring; Nonintrusive Measurement; Optical Measurement

20040040109 Research and Technology Organization, Neuilly-sur-Seine, France
Flight Test Measurement Techniques for Laminar Flow
October 2003; In English; Original contains color illustrations
Report No.(s): RTO-AG-300-Vol-23; AC/323(SCI-040)/45-Vol-23; Copyright; Avail: CASI; C01, CD-ROM

This AGARDograph provides information on flight test techniques, instrumentation, environmental effects, and flight procedures that have been used successfully in laminar flow research. Many techniques are described for measuring the location of boundary layer transition in-flight, from the very simple to the more complex. References to previous works are included for readers to explore. Specific instrumentation for flight is described and the unique environmental effects of flight noted. Procedures for flight test maneuvers are also included.
Author
Laminar Flow; Boundary Layer Transition; Test Facilities; Data Acquisition