

IAA Study Group Status Report

Responsible Commission:

COMMISSION 1: Space Physical Science

Study Number and Title:

1.9 Satellite remote sensing of aerosols in the Earth atmosphere

Short Study Description (repeat from Study Group Proposal):

Overall Goal:

The polarimetry satellite remote sensing of the temporal and spatial distribution of physical parameters of troposphere and stratosphere aerosol and cloud particles in the Earth atmosphere including evaluation their influence on climate, ecology and weather.

Intermediate Goals:

1. Long-term satellite global monitoring and database creation of optical, micro- and macrophysical and chemical characteristics of aerosol and cloud in the Earth atmosphere, their spatial and temporal distribution.

2. Precise quantitative determination of aerosol input to the energy balance of the Earth climate system.

3. Determination of antropogeneous aerosol impact on Earth climate change and ecology.

Methodology:

Forming an international study group, draft a detailed schedule of the study.

Agreement on a study report outline.

Assigning individual responsibility for parts of the study report.

Assigning editor to coordinate individual parts and compile a coherent study report.

Work to be conducted through on-line collaboration and study group meetings held in the course of annual International Astronautical Congresses and the IAA Spring meetings.

Time Line: 2 to 3 Years

Final Product: Report, publications

Target Community: Scientists, engineers, Governments at large, local authorities, Space Agencies, UN, European Commission

Support Needed: TBD

Potential Sponsors:

National Academy of Sciences of Ukraine; State Space Agency of Ukraine (SSAU); NASA; CNES; European Commission

Progress in past six months:

The works are on the stage of spectropolarimeter ScanPol design and instrument creation. Preparations have already been made for the development of the instrument suite for the "Aerosol-UA" project, in particular, of the polarimeter ScanPol designed for remote-sensing studies of the global distribution of aerosol properties and clouds in the terrestrial atmosphere by means of polarimetric and spectral measurements of the scattered sunlight.

Various components of the polarimeter ScanPol have been prototyped, including the optical-mechanical and electronic assemblies and the scanning mirror controller. The

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conceptual design of the algorithm for the retrieval of aerosol parameters over water and land surfaces and clouds has been developed.

Methods for the validation of satellite data using a mobile sunphotometer station as well as for the calibration of aerosol polarimetry have been further refined. We discuss the timeline of the process for design, building, and launching into orbit a multi-functional high-precision polarimeter and a camera which should make notable contributions to the study of natural and anthropogenic aerosols and their climatic and ecological effects.

The report on "Aerosol-UA" status and progress has been presented at IAA-IISL-MOES-KSCSTE-ISRO International Conference "On Climate Change and Disaster Management", 26-28 February, 2015, Thiruvananthapuram, India

Website Study Information up to date? (Study Group Membership, Study Plan and Schedule): **Yes**

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Members of Study Team

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Study Plan and Schedule

Webpages for Study Group Membership, Study Plan and Schedule at Aerosol-UA Project website <http://aerosol-ua.mao.kiev.ua/index.php/en/main> are updated. Few papers on Study Group theme have been published and are under preparing.

Issues requiring resolution? (recommend approach):

Product Deliveries on Schedule? (If modified explain rationale):

Report, publications

Study Team Member Changes? (List any Study Team Members that you wish to discontinue, and provide names plus contact coordinates of any Members you wish to add on the second page of this Study Update form.) Note: Complete contact information including email, tel. and fax must be provided for all additions. Only Members with complete contact information will be listed and receive formal appointment letters from the IAA Secretariat.)

No changes

Name of person providing Study Group Status (Study Group Chair or Co-Chair):

Study Group Chair

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