

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 purpose and place in the investigation of 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 Earth climate system energy balance.
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 design of spectropolarimeter ScanPol and panoramic camera PanCam.

The spectropolarimeter ScanPol should provide precise orbital measurements of the intensity and polarization of sunlight scattered by the aerosols in atmosphere. The computer model of the optomechanical unit of spectropolarimeter ScanPol is designed. The technical documentation for the manufacture of optical elements of the input lens, collimators, chamber lenses, prisms, Wollaston is developed. Some optical components

already made. The optimal power circuit photodetectors is developed. The scheme sensor with minimum size is developed. Experimental study of threshold sensitivity and interference optical information photodetectors with regard polarimeter design is conducted.

Panoramic camera PanCam will serve to distinguish scene "aerosol/cloud" with one pixel of ScanPol spatial resolution and (optional) to measure aerosol optical depth and aerosol size estimation over ocean. We continue to study aerosol parameters and behavior in the atmosphere over Ukraine. Recently we have published the review on aerosol seasonal variations in Ukraine according to AERONET and POLDER measurements where we presented an investigation of aerosol seasonal variations in several urban/industrial regions in Ukraine (www.atmos-meas-tech-discuss.net/6/10731/2013/).

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

Study Group Membership
Members of Study Team

Chair: **Yatskiv Yaroslav S.**
Secretary: **Milinevsky Gennadi P.**

Other Members:

Degtyarev Olexandr V.
Makarov Olexandr L.
Rosenbush Vera K.
Ventskovsky Oleg M.
Mishchenko Michael I.
Shakhovskoy Dmitriy N.
Sinyavsky Ivan I.
Yuanwei CHEN, Senior Engineer
Wenpo MA, Professor

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> still are under development. 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

August 24, 2014

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

Dr Yaroslav Yatskiv

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Status Report Date: August 24, 2014