

IAA Study Group Status Report

Responsible Commission: Commission 1 - Space Physical Sciences

Study Number and Title: SG1.14 - Title: Integrated Precursor Distinguish in Multi-Geophysical Fields around Global Earthquake Events with Magnitude larger than 7 in Recent 10 Years

Short Study Description (repeat from Study Group Proposal):

Earthquake anomaly distinguishing and determination is one of the most difficulties in the area of natural sciences in the world. Space observation have been showing strong capability to monitoring global seismicity and acquires ten`s times of case study than ground-based observation.

This proposal mainly focus on the case study of global strong earthquake during last 10 years to draw out the statistical characteristics of space-based precursors, including Ionospheric disturbances, Geomagnetic and geo-electrical fields, gravity field, infrared, remote sensing as well as crustal deformation by GNSS and InSAR, making connections among them in temporal and spatial distribution to ensure the reliability of anomaly and improve the distinguishing probability related to earthquakes, and try to make a proposal on global virtual system on earthquake monitoring from space by integrate different satellite resources with multi geophysical and geochemical parameters.

Developing and exploring the new way for earthquake monitoring and prediction, as well as the reliability analysis on anomalies in multi geophysical and geochemical parameters around same earthquakes. Advancing the establishment of the global virtual satellite constellation on earthquake monitoring, including electromagnetic, meteorological, infrared RS and hyper spectral satellites etc.

Progress in past six months:

Under the support of China Aerospace Science & Industry Corp., the project secretary Prof. Xuemin Zhang kept contact with the IAA office and commission 1 secretary to confirm the appointment in this project, until now the project chair and co-chairs all send their approval letters to IAA office, and all of the members have sent back their appointment signature letter to IAA office. Prof. Zhang checked the website in February 2018 of SG1.14 group, and the membership list has been updated correctly.

On February 2, 2018, the first Chinese Electromagnetic satellite Zhangheng-1 (ZH-1) has been launched successfully. Onboard it, there are eight scientific payloads to detect the electric field, magnetic field, plasma parameters and energetic particles. At the end of October 2018, ZH-1 has finished its in-situ commission stage. The function and performance of satellite platform and each scientific payload has been tested, and most of them satisfy the general requirements of satellite mission. As while, the satellite data quality has been assessed by comparison with the empirical models and other satellite data. Some interesting phenomena have been detected by ZH-1, including the perturbations in electromagnetic field and plasma parameters induced by artificial VLF transmitters, geomagnetic storms, HF facility, and those related to strong earthquakes. At the first of Novebmer 2018, the ZH-1 mission is successfully accepted by experts. At middle November, the 3rd satellite international meeting was held in Beijing, and the

satellite data and research results have been published to the international society. The new results from ZH-1 will be summarized in our final report to exhibit the new achievement in satellite observations.

Website Study Information update: (please give any update regarding Study Group Membership, documents, Study Plan and Schedule):

The membership list has been updated correctly.

Issues requiring resolution? (recommend approach):

Nothing.

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

Yes.

In 2018, the draft report has been finished and revised in November and December by inserting the new results from ZH-1 satellite together. The final report in Chinese version has been planned in a new project (National Key R&D Program) to publish in 2019. In June and July 2019, the final report in English will be translated from the Chinese version, and it will be submitted to IAA after inspection by the experts group of SG1.14.

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.)

Nothing.

The list of study group members on the website is Ok. It includes:

Chair: Bao Weimin

Co-Chair: Contant Jean-Michel

Co-Chair: Kuznetsov Vladimir

Secretary: Xuemin Zhang

Membership:

Cao Jinbin

Du Jianguo

Hattori Katsumi

He Liming

Kodama Tetsuya

Liu Jann-Yenq

Ouzounov Dimitar

Parrot Michel

Picozza Piergiorgio

Pulinets Sergey A.

Ruzhin Yury

Shen Xuhui

Tramutoli Valerio

Zhou Chen

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

Study Group Chair: Academician Weimin Bao (Study Group Chair),
Secretary: Prof. Xuemin Zhang

Status Report Date: Feb. 21, 2018