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**Committee on the Peaceful Uses of Outer Space**
**Scientific and Technical Subcommittee**
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**Long-term sustainability of outer space activities**

# Workplan of expert group C: space weather

## Working paper submitted by expert group C

## I. Introduction

1. At the forty-ninth session of the Scientific and Technical Subcommittee, the Working Group on the Long-term Sustainability of Outer Space Activities agreed that the expert groups established by the Working Group should prepare draft working documents on the basis of their work, and that those working documents should be made available, in the six official languages of the United Nations, for comments by member States and permanent observers to the Committee on the Peaceful Uses of Outer Space, preferably on the margins of and/or during the fifty-fifth and fifty-sixth sessions of the Committee (A/AC.105/1001, annex IV, paras. 16 and 17).

## II. Objective and outputs

2. Space weather refers to natural processes in space, such as magnetospheric disturbances and solar events, that can affect the near-Earth environment and have adverse impacts on space systems and space activities in general. The objective of expert group C is to gather existing information on space weather and its impacts on space activities and on the current practices, operating procedures and technical standards for mitigating the effects of space weather phenomena on operational space systems. The expert group will provide this information to the Working Group for inclusion in its report. The expert group will also propose voluntary guidelines to enhance the safety of space activities and to reduce the risks from space weather phenomena to the long-term sustainability of space activities.

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3. The expert group will compile a report to support the Working Group in the preparation of its report to the Scientific and Technical Subcommittee. The report will identify the risks that space weather poses to the long-term sustainability of space activities. It will review current practices and procedures pertaining to observations, models and tools for space weather prediction. The report will also review current engineering approaches to mitigate the effects of the space environment and contain an evaluation of the efficacy of current practices in reducing risks.

4. The report will also identify the capabilities required to provide a comprehensive network to support space weather services and will consider possible frameworks for international cooperation and coordination among States on ground-based and space-based space weather research and observations to safeguard space activities.

# III. Method of work

5. The expert group will collect information on the current practices of States and organizations in terms of space weather observation and the various models and tools being used for space weather forecasts.

6. The expert group will hold meetings until June 2014, on the margins of and/or during the sessions of the Scientific and Technical Subcommittee and the Committee and during the International Astronautical Federation congresses held in October each year. The expert group is also considering the possibility of holding an additional regional meeting. Electronic correspondence will be used for communication among expert group members during the periods between meetings.

7. The expert group will coordinate with other expert groups to address overlapping or cross-cutting issues and could decide to hold some of its meetings jointly with the other expert groups to address such matters, as agreed by the Working Group at the forty-ninth session of the Scientific and Technical Subcommittee in February 2012 (A/AC.105/1001, annex IV, para. 16).

8. The expert group will also conduct a gap analysis to identify issues related to space weather affecting the long-term sustainability of outer space activities that are not being addressed in any forum at present, as envisaged in the terms of reference and methods of work of the Working Group (A/66/20, annex II, para. 20) and as reaffirmed in the report of the Working Group at the forty-ninth session of the Scientific and Technical Subcommittee in February 2012 (A/AC.105/1001, annex IV, para. 11).

# IV. Preliminary outline of areas of work

9. The expert group has considered the topics listed in section IV of the terms of reference and methods of work of the Working Group regarding scope (A/66/20, annex II, para. 14) and has agreed on the consideration of these topics as follows:

**(a) Collection, sharing and dissemination of data, model and forecasts**

10. The expert group will collect information on the current practices of States and organizations in terms of space weather observation and the various models and tools being used for space weather forecasts. The expert group has noted that this is the first attempt to collect and consolidate information of this nature on a global scale. Thus the information collected will be useful information for all organizations related to space weather.

**(b) Capabilities to provide a comprehensive and sustainable network of sources of key data in order to observe and measure phenomena related to space weather in real or near-real time**

11. It is important to form a network that continuously provides key data related to space weather in real time or near-real time. Further discussion is necessary to identify the key data to be provided. The first step will be to collect information on data provision and the available networks.

**(c) Open sharing of established practices and guidelines to mitigate the impact of space weather phenomena on operational space systems**

12. Established practices to mitigate the impact of space weather phenomena on space systems vary from State to State, and even basic standards for the design of satellites are different. The expert group has noted that as the situation concerning the sharing of knowledge and practices is different in each State, it may be difficult to compile information from all States. The expert group will work to improve standards by enhancing the sharing of related information.

**(d) Coordination among States on ground-based and space-based space weather observations in order to safeguard space activities**

13. The expert group recognizes the importance of coordination among States in space weather observations. The expert group will consider the possible modalities of sharing data. The expert group will also consider the risks arising from space weather, with a view to proposing which types of key data ought to be shared in order to safeguard space activities from detrimental effects of space weather.

14. The expert group will give due consideration to identifying those space weather issues that require attention in the short, medium and long term, given the risk they pose to and impact on the long-term sustainability of space activities.

# V. Preliminary schedule of work

15. The expert group intends to carry out its work in accordance with the following indicative workplan:

2012 Collect information on the current practice of States and organizations in terms of space weather observation and the various models and tools being used for space weather forecasts. Begin consolidation of the information provided by States, intergovernmental organizations and other entities as inputs to its work. Coordinate with other expert groups to identify areas of overlap and space weather issues pertaining to long-term sustainability not being addressed in any forum at present. Begin to consider recommended guidelines for submission to the Working Group and commence development of the draft report of the expert group containing findings and recommendations. Prepare for the second workshop on long-term sustainability, to be organized by the Working Group in 2013.

2013 Consider further inputs received from States, intergovernmental organizations and other relevant entities, and inputs received from the workshop held in conjunction with the fiftieth session of the Subcommittee. Review of and agreement on the guidelines to be proposed by the expert group. Review of and agreement on the expert group's draft report and recommendations. Submission of the expert group's inputs to the Working Group and review of the relevant sections of the Working Group's draft report, to be prepared for consideration by the Working Group at its meetings during the fifty-first session of the Subcommittee, in 2014.

2014 Additional work as required to support preparation of the report of the Working Group, to be submitted to the Scientific and Technical Subcommittee.