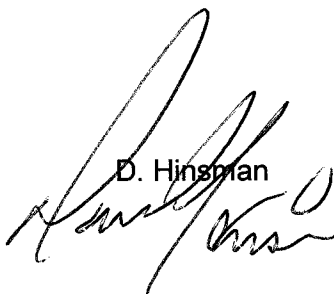
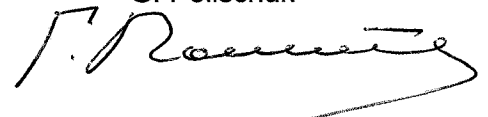


V. Asmus

D. Hinsman

G. Polishchuk

### Protocol

for the Second Session of the International Geostationary Laboratory on Highly Elliptical Orbits Focus Group (IGEOLAB HEO FG) to assess potential joint activities on the "Arctica" and Canadian Space Agency HEO Projects

1. Members of IGEOLAB HEO FG listened to a report by Prof. Polishchuk from the Federal Enterprise "Lavochkin Association" on the Russian Federation's Arctica Project. Dr Kroupnik from the Canadian Space Agency (CSA) presented the status in the planning towards its Polar Communications and Weather (PCW) mission. Prof McConnell provided an analysis of an optional suite of instruments for a HEO mission, presented for consideration to CSA. Dr. Bajpai (NOAA) presented a long term vision for a national USA MEO mission. Mr Selin (Roscosmos) presented an overview of the Russian Federation Earth observation satellite programme for 2006 to 2015 and current status of the "Arctica" Project. Dr Hinsman, Director of the WMO Space Programme, described WMO's potential role to facilitate international science teams for spacecraft instruments, ground processing algorithms and validation mechanisms, and involvement in the user and ground segments.
2. The session confirmed the high importance for the development of space systems allowing continuous monitoring of the polar regions that would respond to user requirements and provide for an IPY Legacy.
3. The session noted that the space systems described in presentations provided by NOAA and CSA on their national vision/initiative would be valuable for MEO/HEO missions and required further elaboration. The session also noted that the Russian Federation Project is based on mature technologies and extensive heritage in use of Molniya type orbit.
4. The session noted the importance of Earth observations and communications components for the polar region. At the same time, the session also noted the considerable technical challenges if these two functions are implemented on the same platform.
5. Following discussion, the members of IGEOLAB HEO FG-2 agreed to the importance of the presented projects and recommended both the "Arctica" Project and CSA's PCW mission for further consideration in the framework of the IGEOLAB international concept.
6. Focus Group members reviewed the proposal by Roshydromet and Roscosmos to use Russian high-end modules of space hydrometeorological equipment and base orbital platform, launching facilities as well as ground infrastructure modules for SC control and data receipt and processing for "Arctica" project implementation. In particular, Focus Group members noted the Russian Federation's intention to use base modules being tested on Russian "Electro" and "Spektr" space systems that would reduce risk and cost of the "Arctica" Project and shorten its implementation.. The session also noted that there is a reserve available for other instruments up to 500 kg.
7. Implementation of the presented HEO missions will provide progress in the field of numerical weather forecasting especially in the polar regions. Such improvements will allow Northern countries to better forecast severe weather and climate anomalies which have considerable social and economic impacts.
8. Focus Group members agreed to recommend to their respective space agencies and meteorological services to consider international cooperation including joint manufacturing and use of equipment, software and information resources of "Arctica" space system.

9. The Russian Federation analyzed the Finnish proposal to provide an instrument to supplement already manifested instruments on the "Arctica" SC with a UV Auroral Imager for aurora studies, as well as proposal to use Finnish ground station. The Russian Federation agreed to review and discuss specific technical issues with Finland on a bilateral basis.
10. For the CSA's project, the session noted that it was following traditional satellite system development phases and was presently in Phase 0 to identify user and science needs and system feasibilities. CSA anticipates completion of Phase 0 in mid 2008 and to move into Phase A by the end of 2008.
11. The session noted the strong willingness on the parts of the Russian Space Agency and the Canadian Space Agency to consider higher-level cooperation in HEO missions and suggested that harmonization between the respective initiatives for HEO would offer advantages for the realization of a HEO mission and should be further explored.
12. Focus Group members recommend the following:
  - To hold a third IGEOLAB HEO FG session in March 2008, tentatively in Canada [TBC], to examine a consolidated set of user requirements, identify potential mission architectures and explore possible models of collaboration;
  - Canada and the Russian Federation were encouraged to start bilateral technical meetings as soon as possible, preferably prior to the March 2008 meeting;
  - To carry out further work on international cooperation on bilateral and multi-lateral basis taking advantage of WMO's considerable expertise to facilitate international science teams for spacecraft instruments, ground processing algorithms and validation mechanisms, and involvement in the user and ground segments.

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