Network of geophysical observations in Russian Arctica

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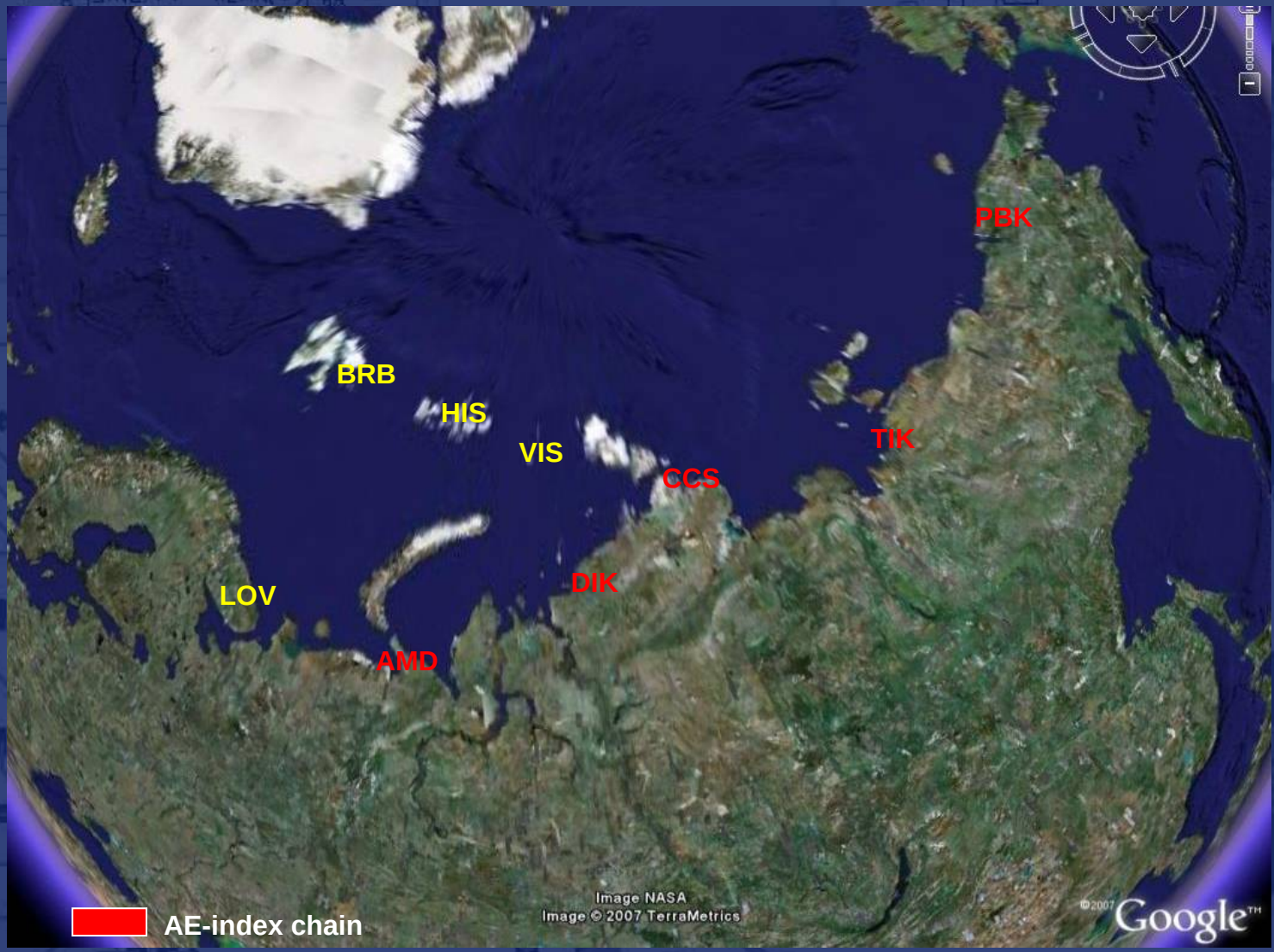
Russian Arctic magnetometric network (main stations)



AE index of magnetic activity in the auroral zone

- The AE index is designated to characterize the intensity of magnetic disturbances in the auroral zone (substorms) exerting the adverse effects on communication, energy supply, pipeline and other technical systems.
- Production of the AE index is the international project established during the International Geophysical Year (1957-1958).
- The AE index is derived on the basis of magnetic data from 13 auroral zone stations located in Scandinavia, Island, Greenland, Canada, Alaska and Russia.
- Starting in 1995 the AE index is calculated in quasi-real time in the World Data Center C-2 (Kyoto, Japan).

Providing the magnetic data from Russian stations

- To ensure the on-line transmission of magnetic data the international community provided us with the up-to-date magnetometer instruments and systems for collecting, processing and transmitting the data. These facilities were deployed in 1995- 2000 at stations Amderma, Dikson, Cape Chelyuskin, Tiksi and Pebek, the data being transmitted to WDC C-2 through the Japanese geostationary satellite.

- These systems were put out of operation by 2006 by reason of harsh climatic conditions, the system inadequacy to work in these conditions and absence of qualified specialists at the remote stations.

- A new system for the automatic collecting, processing and transmitting the magnetic data was elaborated in AARI. The first system was deployed at Amderma in 2006 and demonstrated the high reliability, the second system will be deployed at Dikson this year.

- Full reconstruction of the geomagnetic stations in Arctica is planned for nearest two years, the automatic on-line transmission of data being realized through either geostationary satellites or Roshydromet communication systems.

Amderma (AMD) magnetic observatory 69.6ºN 61.4ºE

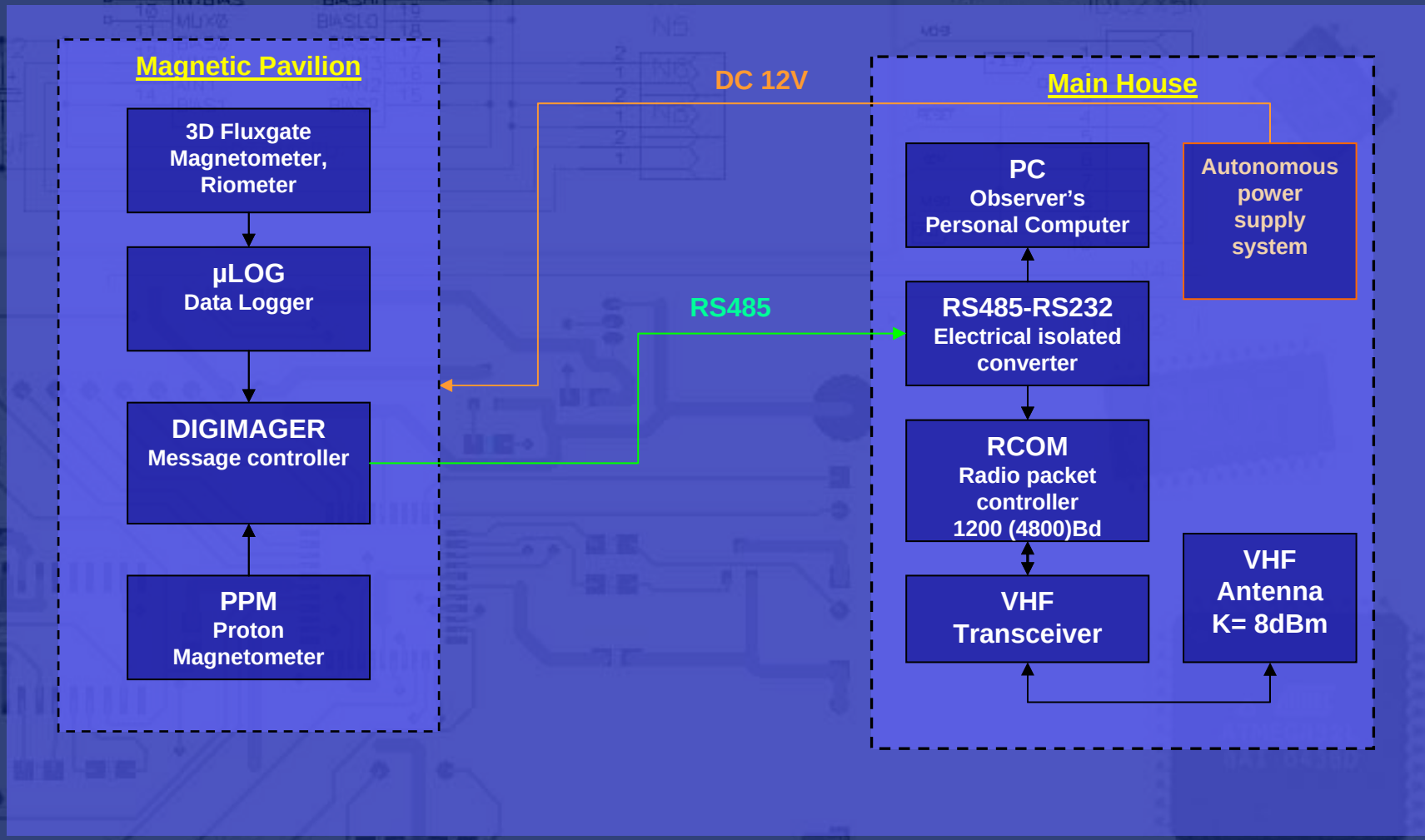
Amderma (AMD) observatory as an example of upgrading advantage

Basic demands for design of the new equipment

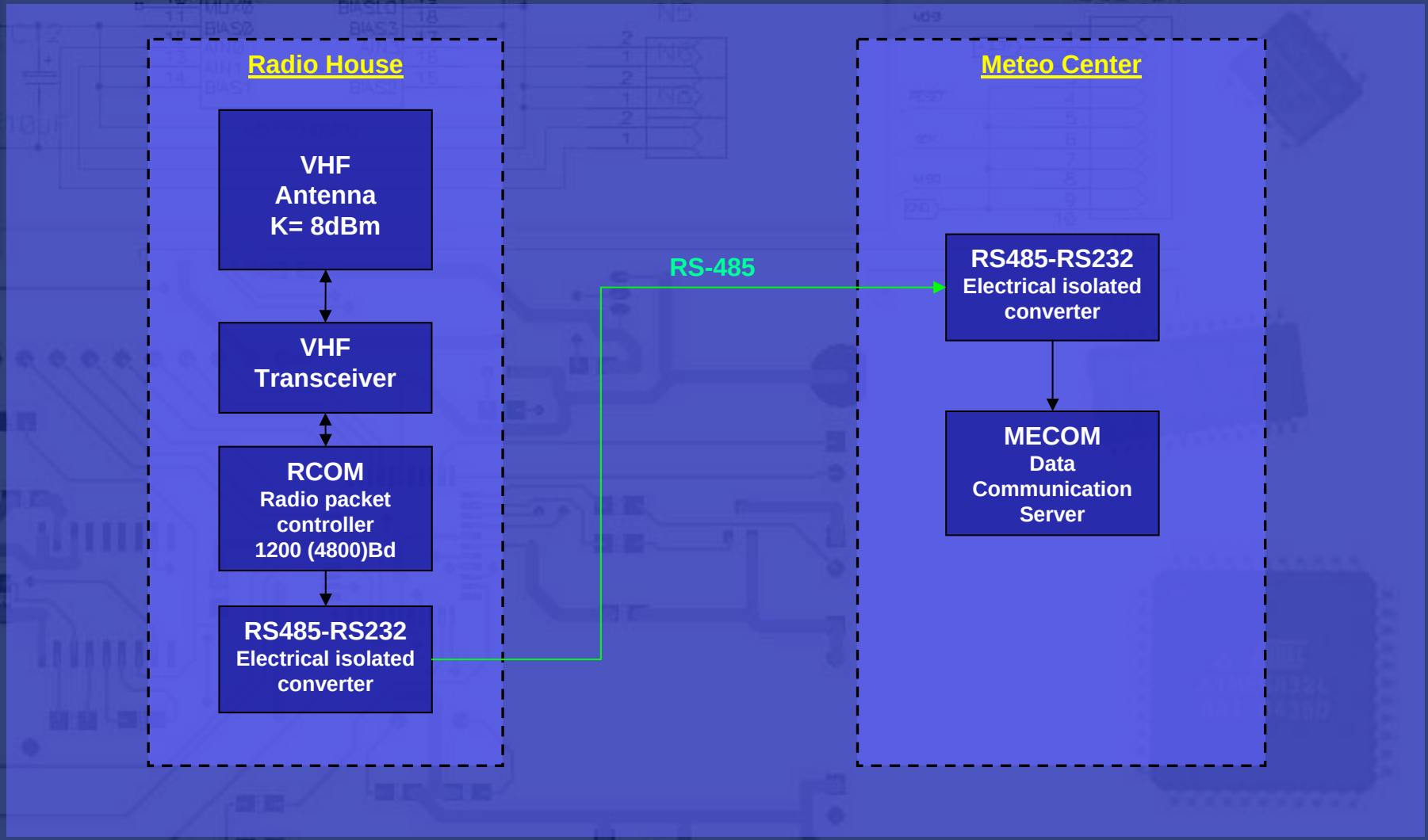
- Endurance to outside climatic conditions
- Autonomous power supply from energy storage device charged by wind generator ext.
- Digital data storage system reliability
- Compatibility to the different data communication system for on-line data transmission

Digital equipment placed in the magnetic pavilion

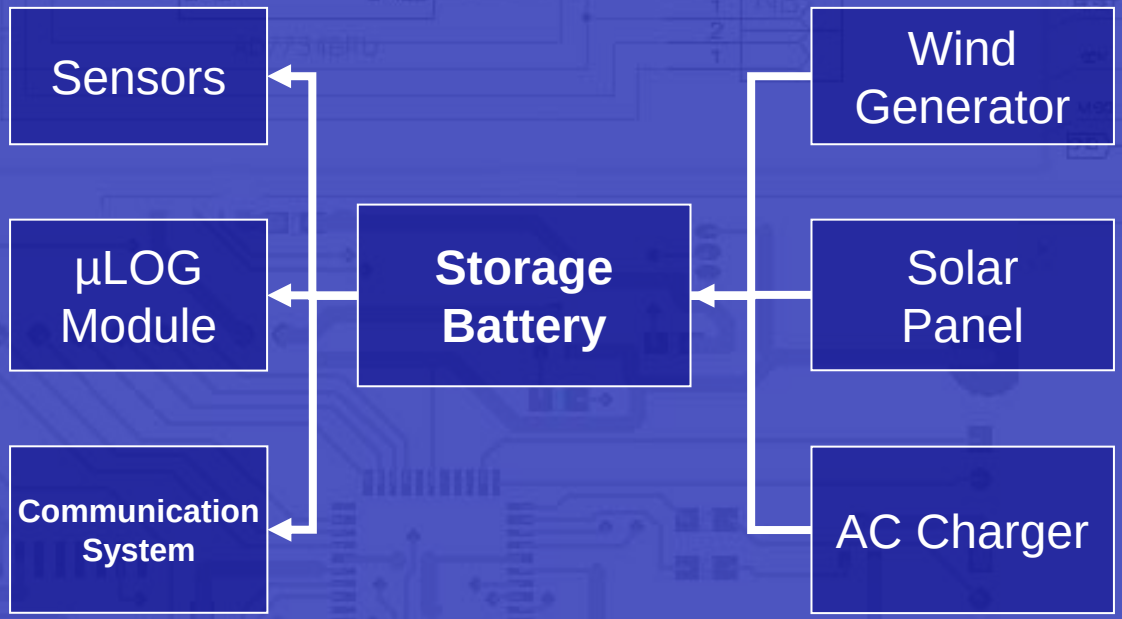
Segment of magnetic equipment on the AMD observatory



Communication Segment on the Local Meteorological Center



Power reduction and alternative energy sources



Estimated average power consumption < 5W

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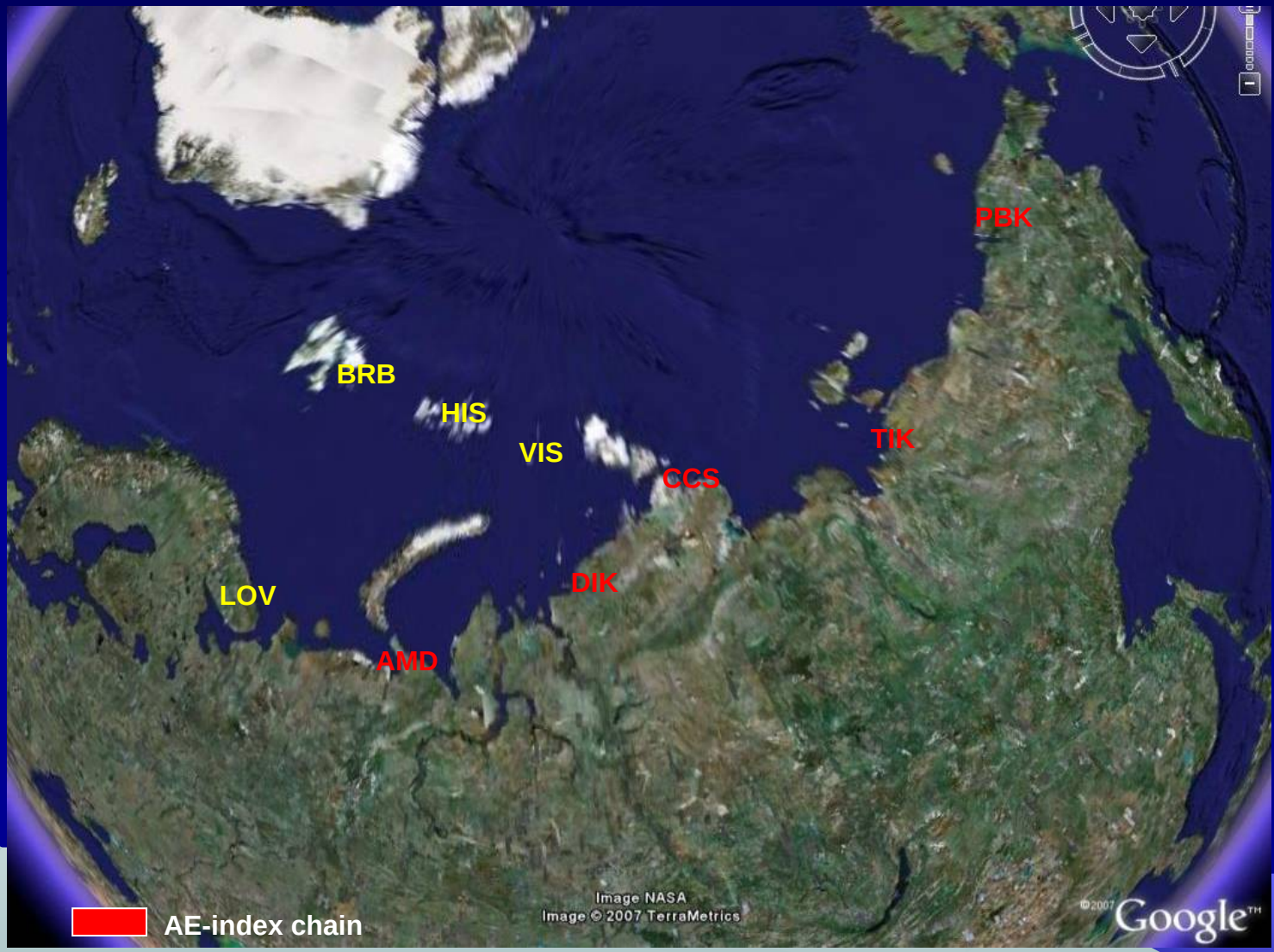


Thank you for attention!