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SPACE WEATHER AWESOME VLF MONITORING IN AZERBAIJANI SITE AND  
INTERNATIONAL COOPERATION

**Abstract**

Ground-based Very Low Frequency (VLF) receiver enables handling of data that is used by researchers conducting ionospheric and space weather research. Sub-ionospheric VLF observations allow the measurement of the lower ionosphere, normally not accessible with other instruments. Alongside other more than 20 world-wide sites, VLF signals are monitored continuously at Azerbaijani Pirgulu location (48 deg 35 min E, 40 deg 46 min N, Shamakhy Astrophysical Observatory (ShAO), Azerbaijan National Academy of Sciences) with the help of AWESOME VLF receiver delivered by STAR Lab from Stanford University (Prof. U. Inan) in context of the IHY/UNBSS program for 2007 as part of the United Nations initiative to place scientific instruments in developing countries. The registered data is also fully stored in local digital archive. VLF monitor is considered to be one of important tools in understanding how the Sun affects the Earth's environment. It could also be used in future scientific studies and will enable to understand the generation and propagation mechanism of naturally occurring VLF waves such as radio atmospherics from lightning flashes, VLF emissions, to conduct remote sensing of the lower ionosphere, lightning and thunderstorms, to investigate long-term trends during quiet and active solar periods, to find correlation between VLF wave activity and geomagnetic activity, etc. These narrowband VLF signals and planned installation of two SuperSID space weather monitor in Azerbaijani middle latitude region will help to study sudden ionospheric disturbance (SID's) associated with transient phenomena like solar flares, geomagnetic storms, effects of lightning discharge, sprites, etc. Sub-ionospheric VLF signals are also helpful in study of VLF waves as a precursor to earthquakes. It is actual problem for Azerbaijan as one of seismically active regions. We plan to study local and regional earthquakes having place in Asian region covered by measured VLF signals. We took part in VLF international experiment (India, Azerbaijan, Uzbekistan, Turkey) during total solar eclipse of 22 July 2009 (longest total solar eclipse during 21st century) and annular solar eclipse of 15 January 2010. Preliminary results were discussed and analyzed by collaborators. We intend to install second VLF monitor in Batabat site (Nakhchivan, Azerbaijan) with ideal astroclimate and almost zero electromagnetic background and to conduct synchronous experiments in 2 sites located in different longitudes and latitudes with different electromagnetic background conditions. AWESOME VLF receiver is also planned for use in educational outreach. We plan to enlarge our scientific collaboration and host forthcoming Azerbaijani-Stanford University Space Weather-VLF Workshop.