[구SE-05] Current Status of KASI Solar Radio Observing System

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Korea Astronomy and Space Science Institute (KASI) operates 2 solar radio observing facilities, e-CALLISTO (Earthwide network of Compound Astronomical Low-cost Low-frequency Instrument for Transportable Observatory) station and Korean Solar Radio Burst Locator (KSRBL). Although e-CALLISTO tracking system improvement.is underway, at least 6 new events were observed in this year. Software development for KSRBL is in progress. The antenna calibration software was updated and flux calibration software was developed. Also the automatic daily overview spectrum monitoring system is now operational. We found solutions to several problems including spurious data and FPGA board communication. However, a few minor unsolved hardware problems still persist. Meanwhile, at least 6 new events were observed by KSRBL in this year, and a comparative study with HXR is currently underway.

[초SE-06] Large Solar Eruptive Events

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Major solar eruptive events, consisting of both a large flare and a near simultaneous fast coronal mass ejection (CME), are the most powerful explosions in the solar system, releasing 10^{32}-10^{33} ergs in ~10^{3-4} s. They are also the most powerful and energetic particle accelerators, producing ions up to tens of GeV and electrons up to hundreds of MeV. For flares, the accelerated particles often contain up to ~50% of the total energy released, a remarkable efficiency that indicates the particle acceleration is intimately related to the energy release process. Similar transient energy release/particle acceleration processes appear to occur elsewhere in the universe, in stellar flares, magnetars, etc. Escaping solar energetic particles (SEPs) appear to be accelerated by the shock wave driven by the fast CME at altitudes of ~1 40 R_s, with an efficiency of ~10%, about what is required for supernova shock waves to produce galactic cosmic rays. Thus, large solar eruptive events are our most accessible laboratory for understanding the fundamental physics of transient energy release and particle acceleration in cosmic magnetized plasmas. They also produce the most extreme space weather - the escaping SEPs are a major radiation hazard for spacecraft and humans in space, the intense flare photon emissions disrupt GPS and communications on the Earth, while the fast CME restructures the interplanetary medium with severe effects on the magnetospheres and atmospheres of the Earth and other planets. Here I review present observations of large solar eruptive events, and future space and ground-based measurements needed to understand the fundamental processes involved.