[구SE-24] Design of Korean Data Center for SDO

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NASA launched Solar Dynamics Observatory (SDO) on February 2011 in order to understand the cause of solar activities and their influences on the Earth and the near-Earth space. KASI is constructing Korean Data Center for SDO based on the letter of agreement between KASI and NASA for space weather research. SDO produces about 1.5 TB a day and its raw data amounts to about 550 TB in a year. Stanford University has been already operating the data center for scientific raw data, but there is a limit to use its data for space weather research and space weather service in real time because of network environment. Korean Data Center for SDO will provide scientific data not only to Korean institutes but also to international space weather societies. KASI has designed the data transfer system by using GLORIAD in order to get higher performance and stability. After the first construction of data transfer system and storage system in this year, we will increase the storage capacity of the data center in phases considering new developments in a storage technology and drop of their prices.

[구SE-25] Proton Temperature Anisotropy vs Parallel Beta in the Solar Wind

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In view of the planned NASA's and ESA's Solar Probe Plus and Solar Orbiter missions, respectively, to probe the inner heliosphere and the Sun's corona, it is timely to investigate outstanding problems associated with the solar wind. Among them is the temperature anisotropy problem. As the solar wind expands into the interplanetary space, the density and magnetic field decreases radially, thus leading to temperature anisotropy ($T_\parallel \gg T_\perp$). However, the measured temperature anisotropy can at times be characterized by $T_\perp > T_\parallel$, while at other times the measured $T_\parallel / T_\perp$ is much milder than predicted by adiabatic theory. Physical reasons remain poorly understood. This notwithstanding, it is known from plasma physics that for $T_\perp > T_\parallel$ electromagnetic ion-cyclotron (EMIC) and mirror instabilities are excited, while for $T_\parallel > T_\perp$, fire-hose instability is excited. By constructing the threshold conditions for various instabilities, one may construct a closure relation that may be useful for modeling the solar wind. In the present paper we discuss theoretical construction of the anisotropy-beta relation by means of quasi-linear theories of these instabilities. The present work complements previous efforts on the basis of linear theory, hybrid simulations, and empirical fits of observations.