The Atmospheric Imaging Assembly on the Solar Dynamics Observatory

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The Atmospheric Imaging Assembly (AIA) on SDO will provide revolutionary coverage of the entire visible solar hemisphere, observed from photospheric to coronal temperatures, at 1-arcsecond resolution, with a characteristic cadence of 10 seconds for each channel. The AIA comprises four dual normal-incidence telescopes that enable it to cycle through a set of EUV channels centered on strong emission lines of iron (ranging from Fe IX through XXIII) and helium (304A), plus two UV channels near 1600A and a broad band visible channel. Combined with the (vector-)magnetic imagery from SDO/HMI, the AIA observations will significantly further our understanding of the dynamics of the magnetic field in the solar atmosphere and heliosphere, both in quiescent and eruptive stages. The comprehensive thermal coverage of the corona will open new avenues of study for coronal energetics and seismology, which will benefit from the excellent calibration against the SDO/EVE spectral irradiance measurements. The AIA data will be easily accessible on the web, with a time delay that is expected to be of the order of 15 minutes to 1 hour. Users will be able to browse the data through summary web pages that are complemented by a comprehensive metadata catalog. Data analysis will be supported through the freely available SolarSoft libraries and through modules in a flexible, evolving pipeline data-analysis system to be operated at the AIA-HMI Joint Science Operations Center. We plan to incorporate feature recognition software, automated movie making, coronal field modeling, and other supporting analysis software. We invite the broad ILWS community to contact us with ideas to collaborate on any aspect of the AIA Investigation. Details on the AIA instrument, the Science Investigation, and related news can be found at http://aia.lmsal.com.