

Solar Origins of Irradiance Variations  
NASA Living With a Star Focused Science Team  
Summer 2008 Progress Report

Our focus team held a very successful second meeting at HAO in Boulder, CO on July 22 and 23, 2008. The attendees were Juan Fontenla, Margit Harberreiter, Jerry Harder, James Klimchuk, Jon Linker, Roberto Lionello, Dibyendu Nandi, Judit Pap, and Dora Preminger. Each group gave a presentation updating their progress, and there was active discussion throughout. A number of areas of potential collaboration were identified, as listed below. These will be pursued over the coming months.

1. Use SOT, XRT, and EIS data from Hinode to investigate how the soft X-ray and UV irradiance depends on the unsigned electric current in active regions. Particular attention will be given to small scale currents that are not easily detected by ground-based vector magnetographs with coarse-to-moderate resolution. (Nandi and Klimchuk groups)
2. Determine the degree of overlap of magnetic fragments and faculae identified by automated techniques. Do the techniques find the same features, as is commonly assumed? (Nandi and Pap groups)
3. Investigate how irradiance correlates with the magnetic flux of sunspots using the “h-function.” (Nandi, Pap, and Fontenla groups)
4. Determine the soft X-ray and UV spectrum predicted by models of the corona and middle/upper transition region and compare it to the observed spectrum. (Fontenla, Lionello, and Klimchuk groups)
5. Study the factors that affect thermal nonequilibrium in coronal loops. In particular, identify which factors lead to full condensation formation. (Klimchuk and Lionello groups)
6. Compare the solar cycle variation of VIRGO/SOHO and SIM/SORCE measurements at various wavelengths. (Pap and Fontenla groups)

Team campaign:

At a later stage, all the groups will apply their analysis and modeling techniques to the same active region, and the results will be compared and contrasted. Active Region #10961 observed from 22:40-23:35 UT on June 30, 2007 has been identified as a candidate target.

Other recent activities include the expansion of our Team website (<http://solar.physics.montana.edu/irradiance/>, Dibyendu Nandi webmaster), the submission of a NASA science nugget describing some of the Team’s progress, and a press release.