Amr
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Poster
Active Regions (ARs) are regions of strong magnetic field flux in the solar photosphere. Understanding the global evolution of ARs is critical for solar magnetism as well as for accurate space weather forecasting applications. We used the brightening of the solar corona in extreme ultraviolet (EUV) 304 Å images as a proxy for the magnetic ARs. In this study, we examine different AR datasets to investigate the relationship between the helioseismic signatures and EUV source distributions of strong magnetic regions in the Sun's far hemisphere. For the EUV component of the study, we use synchronic EUV maps at 304 Å comprised of observations from the Solar Dynamics Observatory/Atmospheric Imaging Assembly (SDO/AIA) with Solar TErrestrial RElations Observatory/Extreme UltraViolet Imager (STEREO/EUVI) instruments. For the far-side helioseismic observations, we used seismic phase-shift maps of the Sun’s far hemisphere, computed from the National Solar Observatory/Global Oscillation Network Group’s (NSO/GONG) Dopplergrams. We present the first global EUV/AR catalog of the whole Sun, providing several basic parameters: location, area, tilt angle, EUV flux, and latitudinal and longitudinal extent of the identified ARs. We also present a similar catalog for the far-side GONG/ARs where the helioseismic phase shift parameters are included. Helioseismic far-side GONG/ARs are examined and their success at predicting far-side strong ARs is assessed. We finally discuss the ARs temporal and spatial evolution of the global EUV/ARs and far-side GONG/ARs during the maxima of Solar Cycle 24 (May 2010 - May 2016).

Poster category:

Poster category
Solar and Interplanetary Research and Applications
Poster session day
Tuesday, April 16, 2024
Poster location
2
Meeting homepage
Space Weather Workshop 2024
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