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Improving the Forecasting of The Drivers of Severe Space Weather MEGAN FISHER, College of Wooster, DAVID FALCONER, The University of Alabama Huntsville/ NASA MSFC, RONALD MOORE, NASA MSFC, SANJIV TIWARI, BAERI — The Sun produces large flares and coronal mass ejections (CMEs) that endanger astronauts. MAG4 is a large-database forecasting technique for forecasting an active regions (ARs) next day production rate of major flares from an ARs free energy proxy and short-term previous flare productivity. The free-energy proxy is measured from an HMI vector magnetogram. MAG4 presently uses a deprojected HMI vector magnetogram to estimate what the MDI AR line-of-sight magnetogram would look like, then applies the proxy measured from that to forecasting curves derived from MAG4s large database of MDI AR line-of-sight magnetograms and histories of major-flare production of 3,000 ARs. We quantify the improvements in MAG4s major-flare forecasting performance that result from using HMI forecasting curves instead of using MDI forecasting curves. We make a forecasting curve from the control sample and then use that curve to make a forecast for each AR magnetogram in the experimental sample. These forecasts are then compared to the observed major-flare productivity of the experimental-sample ARs and the Heidke skill score is calculated. From histogram of the differences in the Heidke scores, we find an increase in Heidke score of over 0.1 from using HMI forecasting curves, improving accuracy 10%.

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