MAG4 (Magnetogram Forecast)

- Flares like earthquakes are very difficult to predict
- Historical records can provide empirical base forecasts
- MAG4 (Magnetogram Forecast) uses empirical data to predict the event rate of dangerous solar activities
- It does this automatically 24/7, making new forecasts every 96 minutes
- It forecasts **major flares**, coronal mass ejections (**CME**s), and **SPE**s
- **MAG4 solution is easy to understand, portable, reliable, and robust!**
- **POC** David Falconer
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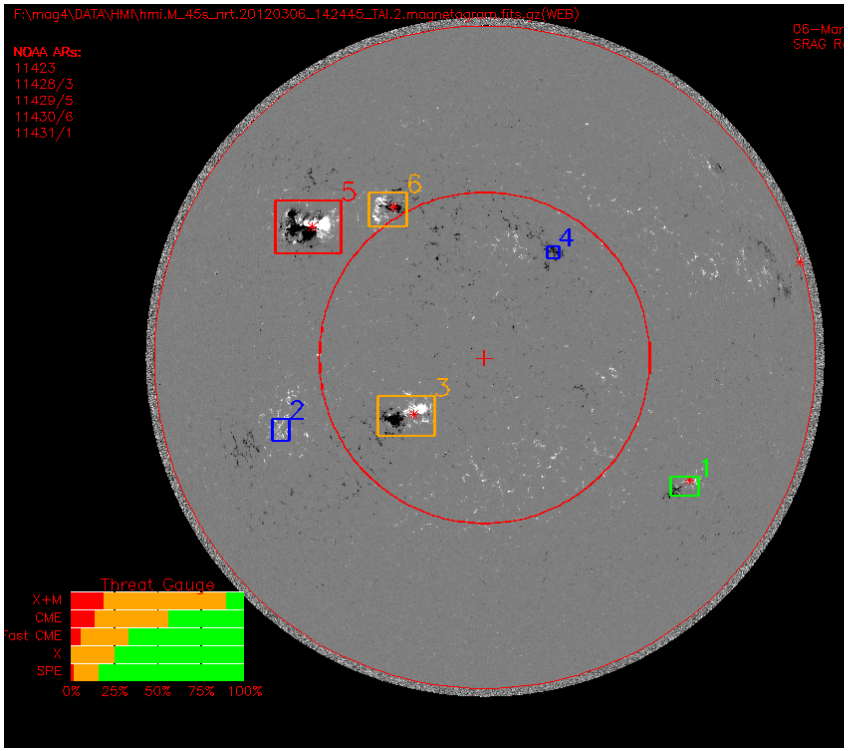
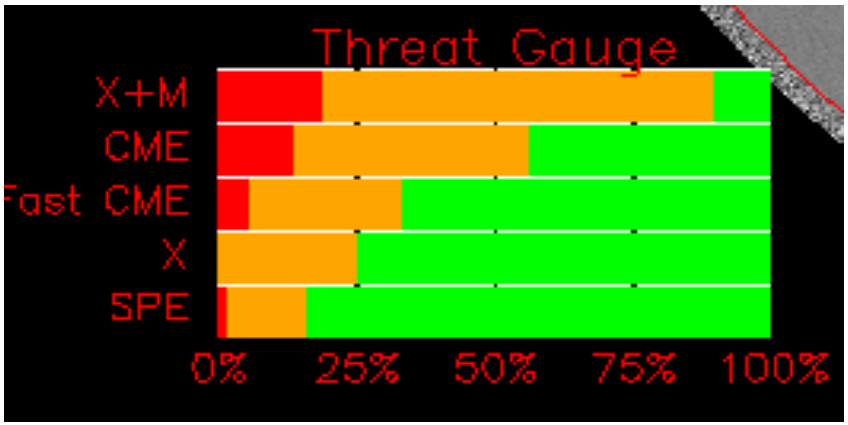
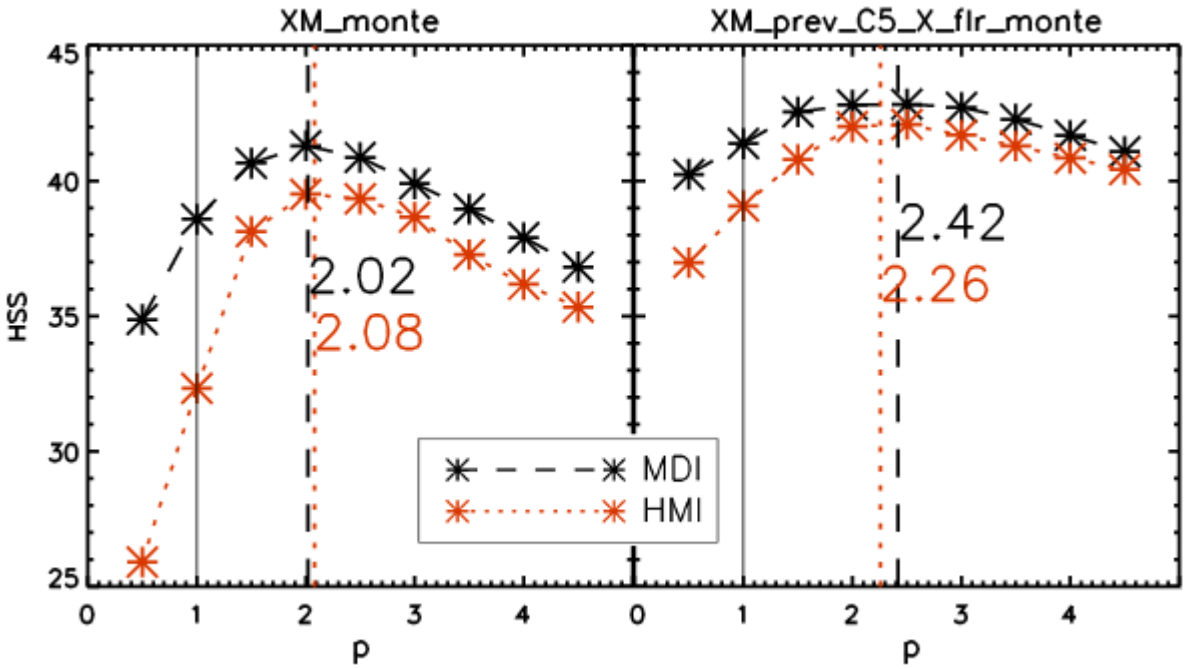




Future MAG4 Improvement



MAG4 uses a free-energy proxy $WL_{SGP}=\int|\nabla B_Z|^p dl$. It presently uses p=1, but calculates for p=0.5 to p =4.5. Will Johnson our NASA Academy student found other P's to be better. The Y-axis is the Heidke Skill score multiplied by 100. The Left plot is for using the free-energy proxy only for forecasting. The right plot is for using free-energy proxy and previous flare activity. The black curves are for MDI-like resolution, the red curve is for full HMI-resolution. In all cases P or 2-2.5 gives better forecasts than 1.