Title: Developing space weather data sets for NOAA's Science on a Sphere®

Derek Young

Bridgewater College

National Oceanic and Atmospheric Administration – Space Weather Prediction Center

Rodney Viereck, Marty Snow

Abstract

Science On a Sphere® (SOS) was originally crafted in 2000 to visualize large-scale environmental changes on Earth. It is a 3-D projection system based on a spherical projection screen. The projection system is ideal for displaying data and model output of Earth and its weather and climate. SOS® has many other applications as well, such as presenting data from other planets and even the sun. Previous models of the sun on SOS® were sequenced with low resolution and low cadence images. The purpose of this project was to create higher resolution and higher cadence movies to use as models for SOS®. Using various IDL routines, images taken from SDO/AIA were processed and sequenced to work properly with SOS® software. One of the challenges was to take a full-disk solar image, unwrap it to create a Cartesian map of the sun, and then rewrap it around the SOS®. The full-disk images do not provide good resolution near the limb of the sun so we created a method of repeating the high resolution central part of the full-disk image three times to fill the Cartesian map. We did this for sequences of images to create a movie, which ended up being smoother and higher resolution than the previous data sets for the sun on SOS®. These IDL routines will be useful in the future to create new sequences of images from different time periods or in different wavelengths. In addition, the IDL routines will be a good starting point for the next iteration of solar imaging for SOS®.