

The Relationship between Sunspots and the Variability of the Solar Corona

Dora Preminger [dora.preminger@csun.edu] and Gary Chapman, San Fernando Observatory, California State University, Northridge.

The San Fernando Observatory has continuous, photometric observations of sunspots since 1986. Sunspot areas are also available from the Greenwich database since 1874. We show that a sunspot measure, such as area or deficit, can be used in a simple, single-parameter model to reconstruct daily variations in the Coronal Index. Our model shows that the Coronal Index can be related to a sunspot measure by convolution with a finite impulse response function (FIR). The FIR is physically meaningful. It is an extended function of time that describes the evolution of an active region in the solar corona, relative to its associated photospheric sunspots. The FIR appears to exhibit a pre-sunspot component, suggesting the possibility of using coronal observations to predict sunspot emergence.