

**NASA CAUSES AND CONSEQUENCES OF THE MINIMUM OF SOLAR CYCLE 23/24
PANEL EVALUATION of
PROPOSAL SUBMITTED IN RESPONSE TO NRA: NNH09ZDA001N**

PI: Hudson, Hugh
Institution: Space Sciences Lab, UC
Proposal No.: CMSC09-0056
Title: Solar Microwave Variation in the Cycle 23/24 Minimum

PROPOSAL SUMMARY

Science Goal

To understand better the behavior of the F10.7 index and its relation to other indices of solar activity.

Methodology

Fixed frequency radio fluxes and the Nobeyama 17 GHz radioheliograms will be used to study the sources of the F10.7 radiation monitored at DRAO. Various other solar activity indices such as SSN and TSI will be compared to the behavior seen in F10.7.

EVALUATION OF SCIENTIFIC AND TECHNICAL MERIT

Scientific and Technical Strengths

- (Major) **F10.7 is the most objective and best calibrated index of solar activity**, so its behavior and relation to other indices should be better understood.
- (Major) **The proposal draws attention to some interesting differences in behavior of solar indices** - most notably the earlier rise of F10.7 in 2009, compared to the SSN, global field, and TSI.

Scientific and Technical Weaknesses

- (Major) **The plan of work is vague and the proposal makes several weakly substantiated assertions on points central to the motivation of the proposed study.**
- (Major) **The proposal gives no plan** for investigating a connection between the early rise in F10.7 and brightening of the poles (and CH's) at higher microwave frequencies. The proposal does not state a mechanism even for this relatively well studied microwave brightening at higher frequencies.
- (Major) **The proposal states that TSI dips are present in the absence of spots, but there is no demonstration of this statement.** To show such behavior would require

establishment, in Fig 1, of an accurate baseline for quiet Sun TSI, and also a demonstration that the TSI variation seen in that Figure when spots are absent, is not due to faculae (since F10.7 continues to vary through such periods in that Figure).

- (Minor) **There is no mention of whether this early rise of F10.7 is present in previous minima**, or whether it is peculiar to this present minimum.
- (Minor) **The change in the SSN/ F10.7 ratio shown in Figs 7,8 begins shortly after the time SSN moved from Zurich to Brussels.** There is no discussion of a possible change in stability of the SSN measurement after this move.

SUMMARY OF EVALUATION OF SCIENTIFIC AND TECHNICAL MERIT

The proposal raises a possibly interesting question about the recent early rise of F10.7, the most objective activity index. Explaining this and some other possibly related aspects of F10.7 would improve our confidence in monitoring solar activity. But the plan of work is vague and the proposal makes several weakly substantiated assertions on points central to the motivation of the proposed study. The proposal is rated Very Good

OVERALL RATING FOR SCIENTIFIC AND TECHNICAL MERIT

Excellent	Very Good	Good	Fair	Poor
	<u>X</u>			