General comments

I like the idea to do use of radiative surfaces to measure the solar irradiance, due their simplicity, further when as the article shows, high level of sensitivity are achieved. Also, the degradation with time is similar to other experiments as the mentioned TIM, probably due the Solar UV influence.

The redaction seems me that could be improved in order to give a better exposition on the instrument environment and their development phase. In particular their ground calibration. Also, I would appreciate an introduction about the different orbits of the selected missions to be compared, SOHO in an orbit around L1, SORCE a LEO orbit of low inclination (40°), and PICARD a Sun-Synchronous orbit basically normal to Sun. Each one has different parasitic influences, from Earth infrared flux and for Albedo, and eclipse frequencies. Therefore, on the simplified equation to compute the Total Solar Irradiance the weight of the Earth Infrared and Albedo should be different.

Specific comments

About the ground calibration, the differences with respect to flight begins with the hypothesis of only emission in infrared for T1. It is not clear in the text, but looks as a window in the vacuum chamber has the influence to change the sense of the T1 to T2 gradient. Figure 3a show a flux level around 390W/m2 continuously. What is the reason to use a peak to 470 W/m2 with a base at 390 W/m2?

The graphs on Figure 3 has different time scales, 3a has period 0:00 to 12:00 (I suppose hours) with 0:00 (24:00/0:00, midnight), and 12:00 as midday. However, 3b to 3d has one 0:00 position after 9:00, as a gap in the data.

The Figure 3d show a heating of instrument, thus a flux increasing, as a time response higher than ON/OFF cycle of 99 min. It is true?.