
Think the way to measure the Earth Radiation Budget and the Total Solar Irradiance with a small satellites constellation

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Résumé

Within the past decade, satellites constellations have become possible and practical. One of the interest to use a satellites constellation is to measure the true Earth Radiation Imbalance, which is a crucial quantity for testing climate models and for predicting the future course of global warming. This measurement presents a high interest because the 2001-2010 decade has not shown the accelerating pace of global warming that most models predict, despite the fact that the greenhouse-gas radiative forcing continues to rise. All estimates (ocean heat content and top of atmosphere) show that over the past decade the Earth radiation imbalance ranges between 0.5 to 1W/m². Up to now, the Earth radiation imbalance has not been measured directly. The only way to measure the imbalance with sufficient accuracy is to measure both the incoming solar radiations (total solar irradiance) and the outgoing terrestrial radiations (top of atmosphere outgoing longwave radiations and shortwave radiations) onboard the same satellite, and ideally, with the same instrument. The incoming solar radiations and the outgoing terrestrial radiations are of nearly equal magnitude of the order of 340.5 W/m

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