Geophysical Research Abstracts
Vol. 17, EGU2015-4448, 2015
EGU General Assembly 2015

Inconsistency in Chinese solar radiation data caused by instrument replacement: Quantification based on pan evaporation observations

Hanbo Yang (1), Zhe Li (1), Mingliang Li (2), and Dawen Yang (1)

(1) Tsinghua University, China (yanghanbo@tsinghua.edu.cn), (2) 2. General Institute of Water Resources and Hydropower Planning and Design, Ministry of Water Resources

Solar radiation determines our climate and hydrological cycle, and it has been widely measured by pyrometers at meteorological stations. In the early 1990s, a large-scale instrument replacement occurred across China, leading to inconsistent solar radiation observations. Fortunately, China has consistent pan evaporation (Epan) observations from Chinese micro-pans (with a diameter of 20 cm) from the 1950s to 2001. This study parameterized the PenPan-20 model for estimating Epan from these pans using a Bayesian approach. Furthermore, based on the PenPan-20 model, a shift in the solar radiation data ($\sim$1.4$\pm$0.5 MJ/(d m2) or 16$\pm$7 W/ m2) in the early 1990s was revealed; this change was likely due to the large-scale retrofitting of new instruments and irregular calibration operations.