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标题: Terahertz Photometer to Observe Solar Flares in Continuum
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摘要: Solar observations at sub-THz frequencies detected a new flare spectral component peaking in the THz range, simultaneously with the well known microwaves component, bringing challenging constraints for interpretation. Higher THz frequencies observations are needed to understand the nature of the mechanisms occurring in flares. A THz photometer system was developed to observe outside the terrestrial atmosphere on stratospheric balloons or satellites, or at exceptionally transparent ground stations. The telescope was designed to observe the whole solar disk detecting small relative changes in input temperature caused by flares at localized positions. A Golay cell detector is preceded by low-pass filters to suppress visible and near IR radiation, a band-pass filter, and a chopper. A prototype was assembled to demonstrate the new concept and the system performance. It can detect temperature variations smaller than 1 K for data sampled at a rate of 10/s, smoothed for intervals larger than 4 s. For a 76 mm aperture, this corresponds to small solar burst intensities at THz frequencies. A system with 3 and 7 THz photometers is being built for solar flare observations on board of stratospheric balloon missions.
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