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Solar flares at submillimeter wavelengths

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The presence of a new solar burst spectral component with flux density increasing with frequency above 200 GHz, spectrally different from the well-known microwave component, has been recently revealed by observations made at 212 and 405 GHz by the Solar Submillimeter Telescope and at 210, 230 and 345 GHz with the telescope of the Köln Observatory for Submillimeter and Millimeter Astronomy. Such unprecedented observations bring new possibilities to explore particle acceleration and energy transport processes during a flare, both observationally and theoretically. In this presentation we give a brief overview of submillimeter and joint microwave and X-ray-gamma-ray observations obtained so far. Possible mechanisms to explain the double spectral components at microwaves and in the submillimeter domain are discussed. We finally emphasize the need of observations at shorter wavelengths, in particular in the far infrared domain, to fully benefit from these new diagnostics of the flaring processes.