



The search for Titan lightning HF radio emissions

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Abstract

We report on the non-detection of HF (high frequency) radio emissions indicative of Titan lightning by the RPWS (Radio and Plasma Wave Science) instrument after more than 70 close flybys of the Cassini spacecraft at Titan. Although convective methane clouds are occasionally observed on Titan, no evidence for lightning was found. Many bursts of Saturn lightning were detected during several Titan flybys. They can be distinguished from potential Titan lightning since they don't fall off in intensity with increasing distance to Titan. We also want to emphasize that great care is needed in the interpretation of bursty signals. We will show examples of spacecraft interferences, Jovian decametric arcs, solar radio emissions or enhanced background fluctuations that mimic lightning burst in a frequency-sweeping receiver. Due to these difficulties, a positive identification of planetary lightning by HF radio emissions at Titan (or Venus) should be based on the detection of at least several tens of bursts, falling off in intensity with distance squared.