

Water vapor plumes at Jupiter' s moon Europa - what we know and what we do not know

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The geologically young ice crust of Jupiter's moon Europa reveals a variety of features that indicate past geological activity. Below the ice there is a global ocean of saline liquid water, detected through magnetic induction signals measured by the Galileo spacecraft. In December 2012, far-ultraviolet (FUV) spectral imaging of Europa by the Hubble Space Telescope revealed localized emission surpluses consistent with a transient H₂O abundance in a small region above the southern anti-Jovian hemisphere. Following this detection of water vapor aurora, several studies claimed supporting evidence for the existence of plumes at Europa. We compare the different studies on Europa' s plumes from the UV observations to the Galileo magnetic field measurements and the searches for thermal anomalies of the icy surface. At the end, we elaborate on possible scenarios for plume sources and processes at Europa and discuss if a comparison to the plumes of Saturn' s moon Enceladus is useful.

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