



How large is the Io UV footprint?

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Located close to the feet of the magnetic field lines connecting Io to each Jovian hemisphere, the Io footprint is the auroral signature of the electromagnetic interaction between Io and Jupiter's magnetosphere. It consists of several spots followed downstream by an extended tail. The size of the main spot is expected to scale to the size of the interaction region close to Io. Consequently, this quantity is crucial to understand the processes involved. However, the main spot size is a controversial issue as previously published values range from ~ 400 km to ~ 10000 km, leading to contradictory conclusions. Based on observations carried on with the Hubble Space Telescope STIS and ACS FUV instruments from 1997 to 2009, we estimate the size of the main footprint spot on a much larger image sample than previously. Additionally, we carefully selected the images in order to avoid viewing geometry ambiguities when measuring the spatial extent of the different features. The main spot length along the footpath is ~ 900 km while its width perpendicular to the footpath is < 200 km. The spot length is larger than the projected diameter of Io along unperturbed magnetic field lines, which appears to be consistent with recent simulations. The vertical extent and the peak altitude of the main spot are similar to those measured in the tail. Nevertheless, the secondary spot attributed to trans-hemispheric electron beams has been measured to peak at ~ 200 km below the main spot and the tail, which confirms their different origins.