Jupiter's Aurora as Imaged by the NASA IRTF and Comparison with Hubble Space Telescope Observations in the UV. M. Lystrup[1], A. Radioti[2], B. Bonfond[2] and D. Grodent[2], [1]Laboratory for Atmospheric & Space Physics, University of Colorado, Boulder (lystrup@lasp.colorado.edu), [2]Université de Liège Institut d'Astrophysique et de Géophysique, Belgium.

Jupiter's UV aurorae have been observed extensively for the last twenty years using the Hubble Space Telescope, the results of which have been published extensively. Ground-based telescope observations of Jupiter's infrared aurora have been made since 1989 and in recent years have been focused on medium and high resolution spectroscopy [1]. The infrared aurora originates in the upper atmosphere at altitudes above the homopause and is primarily due to emissions from the H_3^+ molecular ion, formed as a result of photo ionization of H_2 and impact ionization by precipitating particles from the magnetosphere. Whereas the UV auroral emissions, which are thought to originate from lower altitudes, are a good tracer of magnetospheric energy inputs, the infrared aurora reflects how the atmosphere responds to those inputs. Thus auroral observations in the two wavelength regimes complement each other.

Between 1995 and 2000 a campaign of monitoring Jupiter's infrared H_3^+ aurora was carried out by Connerney and Satoh at the NASA Infrared Telescope Facility. Their observing programs resulted in thousands of images over 51 nights. However, only a small portion of this large data set has been used in previous studies [2]. We examine and reanalyze this data set in order to characterize the morphology of the infrared aurora as compared with the UV aurora. We make particular use of dates in the infrared data set where simultaneous and near-simultaneous observations in the UV exist (July 26, 1998 and December 16, 2000), as made by the STIS instrument on the Hubble Space Telescope. The comparative study addresses the main oval emissions, satellite footprints, and polar aurorae.

We also aim to maximize the science output of the Connerney & Satoh infrared data set by making data products available to the community. The Magnetospheres of Outer Planets research group of the Laboratory for Atmospheric Space Physics at the University of Colorado hosts an archive of past infrared observations of planetary aurora – http://lasp.colorado.edu/mop/resources/irdata/. Along with other ground-based data sets, the data set and related data products used in this study are available for download at this archive.

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