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Spectroscopy: Assignment 1

For the summation of a recent submission in Cornell Library, I have selected ***arXiv:1607.06682 [astro-ph.EP]***.

This entails the optical spectroscopy of comet Lovejoy covering the perihelion and post-perihelion periods for the comet. The origin of this comet is the Oort cloud, and traversed the inner solar system. Using a low resolution spectrograph (LISA) on a half a meter telescope, based in Mount Abu Infrared Observatory in India, the observations were made from late 2014 to early 2015.

Adequate care was taken to make sure that the data is cleaned, in terms of equipment and background noise. Also the data was intensively processed by software to better exclaim the desired features. This rendered strong C₂, C₃ and CN lines, with CN being most prominent, and used for a baseline in the study.

The gas production rates were determined using the Haser coma outflow model, Fink & Hicks(1996). Next they used the Haser Model Estimation to fit the measured points to a curve. They then compared their curve to archives of previous observations (Langland Shula & Smith; A'Hearn(1995)). The plots show that the normalized column densities noticeably exceeds that of the expected values. Which means that the gas production rate of the comet was more than what was expected, if only taking into consideration the flux from the sun.

The extra production is possibly due to elevated activity on the sun at that time, or could be some insight as to the intrinsic nature of the comet itself.

No temperature readings were taken, so we can not discount the solar activity as abnormal.