The Millimeter and Submillimeter Spectrum of CRL 618

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HIFI, the very high resolution heterodyne spectrometer will be able to carry out full spectral line surveys in the submillimeter domain (from $\simeq$0.6 to $\simeq$0.2 mm). Thus, many molecular, atomic and ionic lines will be observed in a fast way with high resolving powers.
In this poster we present for the first time a complete spectral survey of CRL 618 at λ= 3, 2 and 1 mm. Data were taken using the 30 m IRAM telescope between 1999 and 2000 and complemented with Caltech Submillimiter Observatory (CSO) observations. CRL 618 is one of the few clear examples of a C–rich proto-planetary nebula. Extreme physical conditions due to strong UV radiation field and large shocks associated with high velocity winds clearly modify the chemical compositon of its circumstellar envelope. CRL 618 spectrum is characterized by a forest of molecular and recombination lines. Mainly, pure rotational lines from ground and highly vibrationally excited states of HC_3N, HC_5N, HC_7N and its ^{13}C subtituted species contribute to the detected features. Lines show P–Cygni profiles at 3 and 2 mm and emission profiles at 1 mm and shorter wavelengths. This kind of surveys, in addition to being an excellent overview of the molecular content of this circumstellar envelope represents a preparatory study of the programs that could be carried out with FIRST/HIFI and also with PACS and SPIRE.