

A 159211 GHz spectral line survey of SGR B2(N) with the SEPIA receiver at APEX

- Katharina Immer

In 2015, a new receiver was installed at the Atacama Pathfinder Experiment (APEX) telescope, the Swedish-ESO PI receiver for APEX (SEPIA). As a science verification project, we conducted a line survey of SGR B2(N), covering the frequency range 159.2 - 210.7 GHz. This source is dominated by line emission, as already seen at other frequencies. A large number of transitions stronger than 1 K is detected in the spectrum. The strongest emission line originates from the water molecule. Emission from molecules like HCN, HCO+ and HNC is self-absorbed. To identify the transmitting and absorbing molecules within the APEX beam and model their temperatures and densities, we used the Sgr B2 IRAM 30m line survey by Belloche et al. (2013) as a template. Using the XCLASS software, we modeled the emission/ absorption of the different molecules in Belloche et al. (2013) and fitted the results to our data to obtain revised temperature and column density values for all the molecules. Since the main molecules and their isotopologues were modeled as separate species, we determined the isotopologue ratios for a range of molecules. Localising molecules with different sizes of their emission regions or different line widths in temperature vs column density plots, we find that they occupy distinct positions in these plots. I will present the line survey and the results of our radiative transfer modeling.

Other