

**P42a      SiO  $J=5-4$  in the HH 211 protostellar jet imaged with the SMA**

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The Submillimeter Array (SMA) was dedicated in November 2003, and is now fully operational at 230 and 345 GHz with eight 6-m antennas and 2 GHz bandwidth. Using the SMA, we have mapped the SiO  $J=5-4$  line at 217 GHz from the HH211 molecular outflow, which is known to be an extremely young (dynamical age of  $\sim 750$  yr) outflow with well-ordered shell+jet structure. The high resolution map observed with the SMA ( $1.7'' \times 1.1''$ ) shows that the SiO  $J=5-4$  emission comes from the central narrow jet that is unresolved in the transverse direction. A comparison with the SiO  $J=1-0$  map observed with the VLA (Chandler & Richer 2001) shows that the  $J=5-4$  emission is upstream (closer to the central star) with respect to the  $J=1-0$  emission. This suggests that the jet has a remarkable gradient of excitation condition along its axis. In addition, the SiO  $J=5-4$  jet is better collimated than those of the SiO  $J=1-0$  and the CO  $J=2-1$ . This implies that the jet has an axial structure; the highly excited gas concentrated to the close vicinity of the axis is surrounded by the lower excitation gas.

The SMA is a collaborative project of the Smithsonian Astrophysical Observatory (SAO) and the Academia Sinica Institute of Astronomy & Astrophysics of Taiwan (ASIAA).