

H_2D^+ as a probe of the dense regions of the L183 (=L134N) complex

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Abstract.

We observed the ortho- H_2D^+ (1_{10} - 1_{11}) ground transition at 372 GHz with the Caltech Submillimeter Observatory toward the L183 (=L134N) complex. We traced the central ridge and the central peak of L183 (defined in Pagani et al. 2003, A&A 406, L59; 2004, A&A 417, 605) together with detailed maps of several transitions of N_2H^+ and N_2D^+ obtained at IRAM and at CSO. N_2H^+ and N_2D^+ do not trace the dust peak and thus are depleted in the most inner part of the cloud (Pagani et al. 2005, A&A 429, 181) while H_2D^+ , as expected from theory and other source observations (as in the case of L1544; Vastel, Caselli, Ceccarelli et al. *in preparation*) does peak at the dust peak. Surprisingly, the H_2D^+ is very extended, spanning $150''$ in declination and presents a second intensity peak, of similar strength to the main peak, $50''$ north of it. This second peak has no local dust counterpart and thus remains unexplained presently. We also searched for para- D_2H^+ (1_{10} - 1_{01}) at 692 GHz towards the main dust peak but have found no emission so far. The para- D_2H^+ /ortho- H_2D^+ ratio is thus lower than 0.4, two times less than in the case of 16293E and at least 2 times less than in the case of L1544.

Keywords. submillimeter, line: profiles, ISM: abundances, ISM: kinematics and dynamics, ISM: molecules
