

# The Evolutionary Status of the Prestellar Core: L1498

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The processes of forming a protostar from diffuse gas are still not fully understood. There are several important steps, such as the condensation and cooling of the diffuse medium subsequently turns to molecules, the formation of cores that slowly contract to form prestellar cores, and the collapse of prestellar cores to form protostars. In addition, the main mechanism driving above phenomena is also under debate. Two generally accepted theories, turbulence fast decay and slow ambipolar diffusion, predict very different timescales in forming the prestellar cores, even up to a factor of 10. Thus, constraining the ages of the prestellar cores gives an opportunity to answer above questions. Pagani et al. (2013) showed that the deuteration profiles of key species behave differently for the two type of theories, and their measurements on L183 constrain its age to be less than 4 Myr which is more consistent with the turbulence fast decay model. However, these results should be verified with other prestellar cores which are different at evolutionary stages and physical conditions. L1498 is a widely studied and isolated starless core located in Taurus, and found to have strong depletion at the center and possibly magnetic supported. Therefore, L1498 provides a great opportunity to examine whether slow ambipolar diffusion exist at the early stage of star formation. Here, we have obtained the  $\text{H}_2\text{D}^+$  from JCMT,  $\text{N}_2\text{H}^+$  and  $\text{N}_2\text{D}^+$  from IRAM 30m, and  $\text{DCO}^+$  from GBT. We will present our results and discuss the evolutionary status of L1498.