## P154a Temperature structure of the Class I protostar Elias 29 and its environment

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Elias 29 is a low-mass Class I protostar in the Ophiuchus molecular cloud complex. With ALMA, Oya et al. (2018) revealed that this source consists of a compact component (∼50 au) associated to the protostar and a southern ridge component apart from the protostar by 500 au. In the ALMA FAUST program, we identified a parabolic outflow cavity feature in the $C^{18}O$ and SO emission and revealed that it interacts with the southern ridge. In addition, we found a bow shock on the 500 au eastern side of the protostar in the SO emission, which would be an evidence of a protostellar jet. (ASJ meeting in September 2021)

To further characterize the complex structures of this source, we here explore its temperature structure. We prepare the 2D intensity ratio map of $SO(J_N = 6_6 - 5_5)/SO(J_N = 6_5 - 5_4)$ and find the relatively high temperature at the interaction region of the outflow cavity and the bow shock point. We investigate the gas kinetic temperature and the SO column density of this source with LVG model at several points by using the two SO line data as well as the $^{34}SO(J_N = 5_6 - 4_5)$ line data. As a result, we find high temperatures (∼50 K) of the outflow interaction region and the bow shock point, which clearly indicates the shock heating. Furthermore, a relatively warm region is found to be extended in the southern ridge, which would be related to the peculiar chemical composition in this source, i.e., absence of complex organic molecules and low deuterium fractionation.