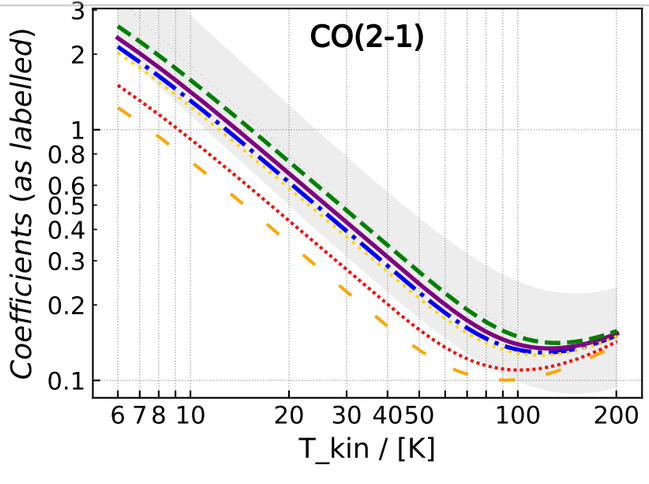
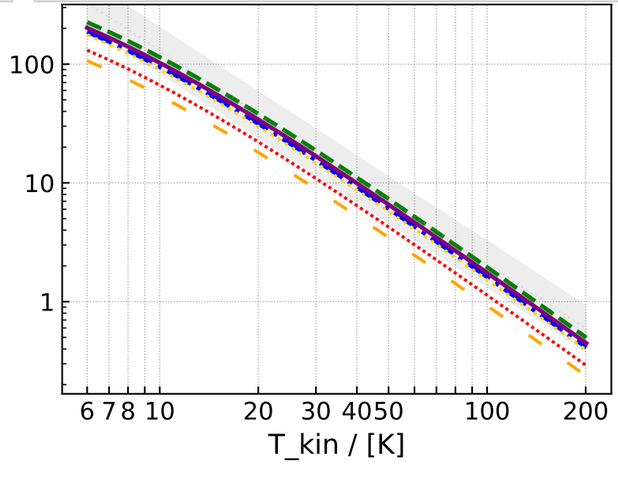
$$\alpha_{\mathrm{CO(2-1)}}^{\mathrm{no\,Helium}} = 0.16 \times [(2\,T_{\mathrm{kin}}/5.53 + 5.02)/100] \times [(\tau_{\mathrm{CO(2-1)}}/(1 - \mathrm{e}^{-\tau_{\mathrm{CO(2-1)}}}))]$$

$$\text{Approx.} = 0.07\,[1 + (T_{\mathrm{kin}}/150)^{2.4}]\,(T_{\mathrm{kin}}/150)^{-1.2} \times (3 \times 10^{-4})/([\mathrm{CO/H_2}])$$



Coeff.: $\tau_{\mathrm{CO(2-1)}}$

Approx.: $y = (T_{\mathrm{kin}}/150)^{-1.8}$ [±0.2 dex]



Coeff.: $\tau_{\mathrm{CO(2-1)}} / (1 - \mathrm{e}^{-\tau_{\mathrm{CO(2-1)}}})$

Approx.: $y = 1.3\,(T_{\mathrm{kin}}/150)^{-1.7}$ [±0.2 dex]