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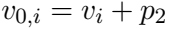






$$\tau_i(v) = \tau_i \cdot \exp \left[-4 \ln 2 \left(\frac{v - v_{0,i}}{p_3} \right)^2 \right]$$









$$\tau(v) = p_4 \sum_{i=1}^N r_i \cdot \exp \left[-4 \ln 2 \left(\frac{v - v_i - p_2}{p_3} \right)^2 \right]$$



$$I_{ant}(v) = \frac{p_1}{p_4} \left(1 - e^{-\tau(v)} \right)$$

$$\tau(v_i + p_2) = p_4 \cdot r_i \quad (\text{assumption A4})$$

$$\sum_i \tau_i = p_4 \cdot S$$

$$T_{\text{ant}}(v_i + p_2) = \frac{p_1}{p_4} (1 - e^{-p_4 r_i})$$

$$T_{\text{ant}}(v_i + p_2) \approx p_1 \cdot r_i$$





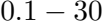






$$T_{\text{ant}}(v) = T_A^*(v) = \frac{B_{\text{eff}}}{F_{\text{eff}}} [T_{\text{ex}} - T_{\text{bg}}] (1 - e^{-\tau(v)})$$

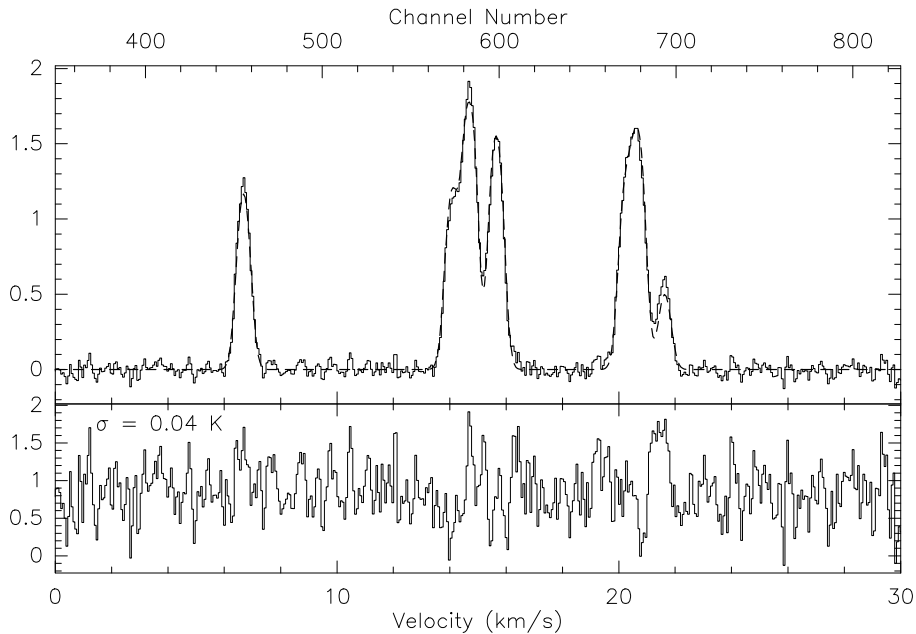
$$T_{ex} = T_{bg} + \frac{F_{eff}}{B_{eff}} \frac{p_1}{p_4}$$





19; 5 TOTO N2H+(1-0) IRAM-30M-B41 +0 +0 Eq 3069. 0

1 0.570 (0.011) 14.692 (0.002) 0.513 (0.004) 0.274 (0.010)



100







$$f(\nu) = \frac{A}{\Delta \nu} \frac{1 + 4H[(\nu - \nu_0)/\Delta \nu]^2}{1 + H/3}$$









$$f(w) = \frac{A}{\Delta v} \frac{1}{1 + \sqrt{2}}$$

$$f(v_0 + v/2) = \frac{A}{v} \frac{1 + B}{1 + B/2}$$

$$\frac{f(\Delta v/2)}{f(0)} = 1 + H$$

$$v_{\text{exp}} = c \frac{\Delta v / 2}{v_0}$$





