

MOLIÈRE – MUSCATT COMPARISON

- Plots are in separate file: molmus.pdf
- Distributions (folded at zero) of projected angle
- Bins as chosen by Muscatt
- Error bars are Muscatt errors
- Red points are Moliere
- Qualitatively the agreement is good
 - Chi-squareds not good assuming Muscatt errors are right
 - May be a systematic effect in second and third bins
 - Is there a free parameter?

- **The Moliere calculation uses Fano's correction for atomic *electrons***
 - **Low-angle cut-off due to atomic binding**
 - **Maximum angle allowed by kinematics of $\mu - e$ scattering**
- **Low-angle cut-off described by a parameter (after a lot of maths) called u_{in} ("in" = inelastic)**
- **Gottschalk says use $u_{in} = 5$ (for general purposes)**
 - **I used 5 for the comparison of 2017-08-08**
- **But back to Fano who says:**
 - **u_{in} can be calculated exactly for H and = 3.6**
 - **Other calculations give < 5 for low Z materials**
- **Quick look suggested $u_{in} = 3.6$ improves fit for H2**
 - **Shall look more systematically**

REFERENCES (Partial)

- **G. Molière, Z. Naturforsch, 3a, 78 (1948) (in German)**
- **H.A. Bethe, Phys. Rev. 89, No. 6, 1256 (1953) (in English)**
- **U. Fano, Phys. Rev. 93, No. 1, 117 (1954)**
- **B. Gottschalk *et al.*, NIM B74 467 (1993)**

- **Also papers by:**
 - **Wentzel, Lewis, Goudsmit & Saunderson, Scott, Snyder & Scott, Kultchitsky & Latyshev, Williams**