**Group Activity 5** 

Due: In class, September 7th

 Estimate the radius of <sup>208</sup>Pb by treating its protons as a Fermi gas. Compare your answer to the common empirically-based estimate.

 The ENSDF database shows <sup>27</sup>Al has 20 cumulative levels at 6MeV and 60 cumulative levels at 8MeV. How many cumulative levels do you expect by 10MeV? Compare to the value quoted on BRUSLIB.

3. When counting nuclear levels, we can generally be sure we are starting to miss some from the spectrum when the log of the level count versus energy starts to have negative curvature. Now that you know that, what is your estimate for the cumulative number of levels for <sup>60</sup>Zn at an excitation energy of 10MeV given the experimental data below? Show how you got your answer and compare to the theoretical estimate on BRUSLIB. (The true cumulative number of levels is ~3x lower (Soltesz et al. PRC 2021).)

