

Problem G

Consider scattering a plane wave off a finite constant spherical potential well

$$V(r) = \begin{cases} -V_0 & r < a \\ 0 & r > a. \end{cases}$$

- (a) In Problem F, we calculated the S -wave contribution to σ for this potential. Simplify the result for σ from problem F in the weak-potential (small V_0) limit.
- (b) Now calculate the low-energy Born approximation cross section σ for this potential.
- (c) Your answers from (a) and (b) should match. Explain why.