The task is to graph the following expression, developed in class. We had a lot of trouble with this, because while it seems straight forward, the parameter values of sa were difficult to pin down for some reason. The produced graph of transmission vs. displacement drops off too quickly according to our standard, but it is within the right ballpark, so I thought it worthwhile to at least include the incorrect result. The following function is plotted:

The transmission

$$T = \frac{1}{1 + \sinh(sa)},$$

with $s = \sqrt{\frac{2m_e E}{\hbar}}$ and a the displacement from the origin.

$E = 5$ eV
$m_e = 5.11*10^6$ eV/c^2
$c = 299792458$ m/s
$\hbar = 6.582*10^{(-16)}$ eV s

So, $s = 3.62*10^{10}$ m^{-1} = 3.62 A^{-1}.

The parameter space is defined from a=0 to a=4 angstroms.