

We investigate the following regularisation procedures:

$$\frac{1}{(p^2 + \Lambda^2)^{1/2}}, \quad (1)$$

$$\tanh\left(\frac{p}{\Lambda}\right). \quad (2)$$

In both cases, the regulator Λ is chosen such that the value of $\text{Im}V_S(r_d, \Lambda)$ reaches 99% of its asymptotic value $\text{Im}V_S(r \rightarrow \infty, \Lambda)$, where r_d is the ‘decorrelation length’ defined via the flattening of the real part of the potential.

Interestingly, the regulators turn out to be quite similar in both cases.

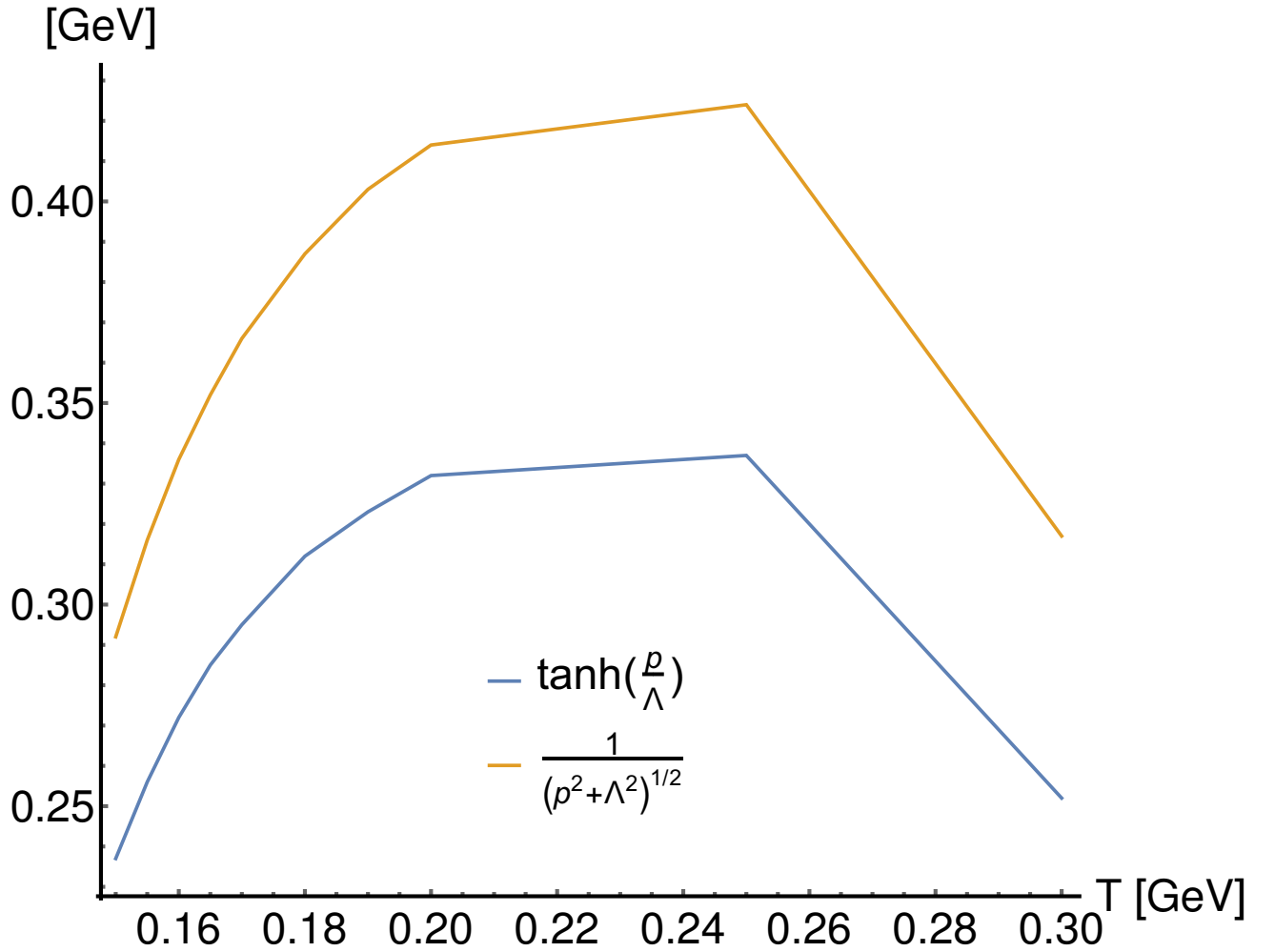


Figure 1: Temperature dependence of the regulators in each case.

Using physical values, the result from using Eq. (1) is

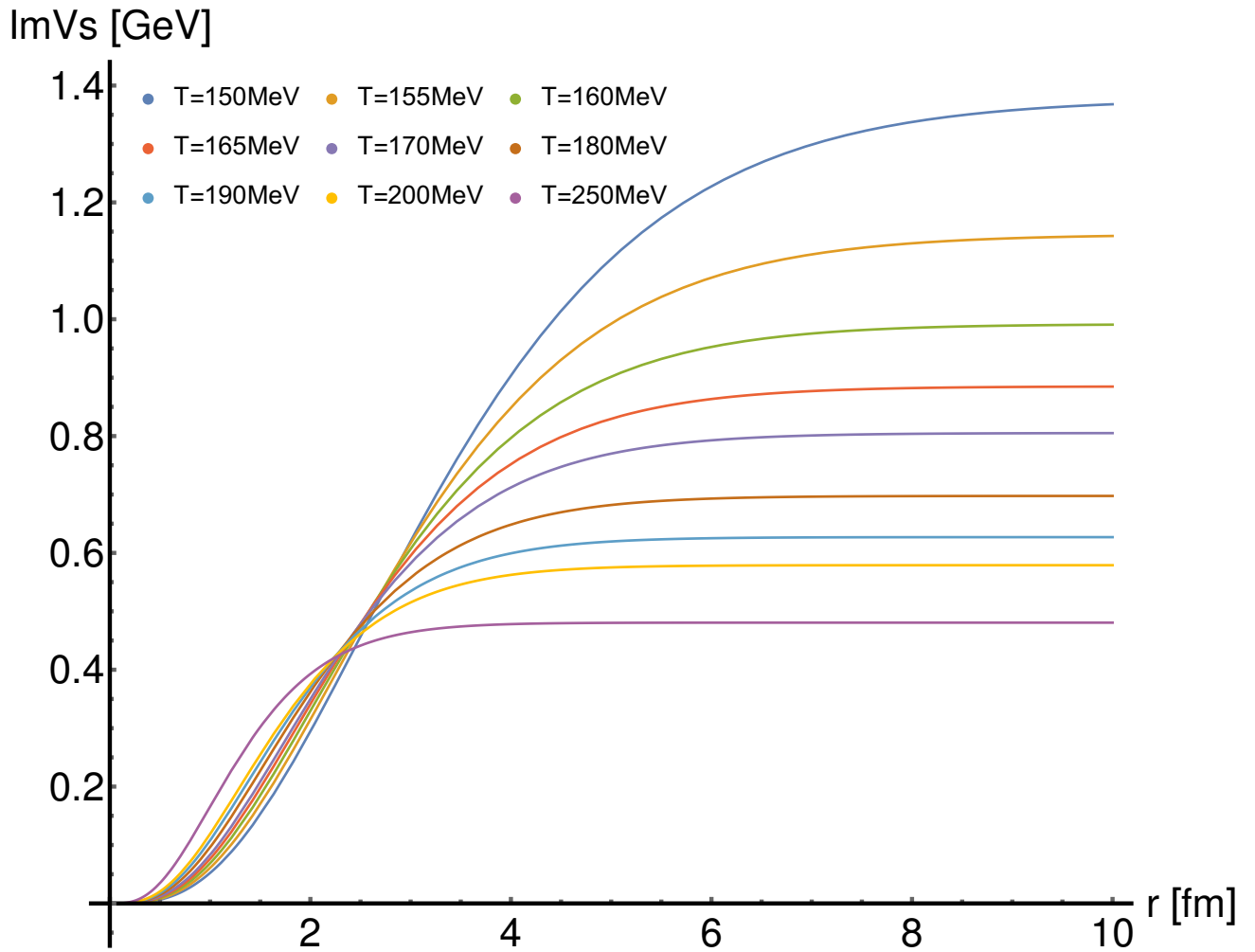


Figure 2: String imaginary part of the potential using Eq. (1).

and from using Eq. (2)

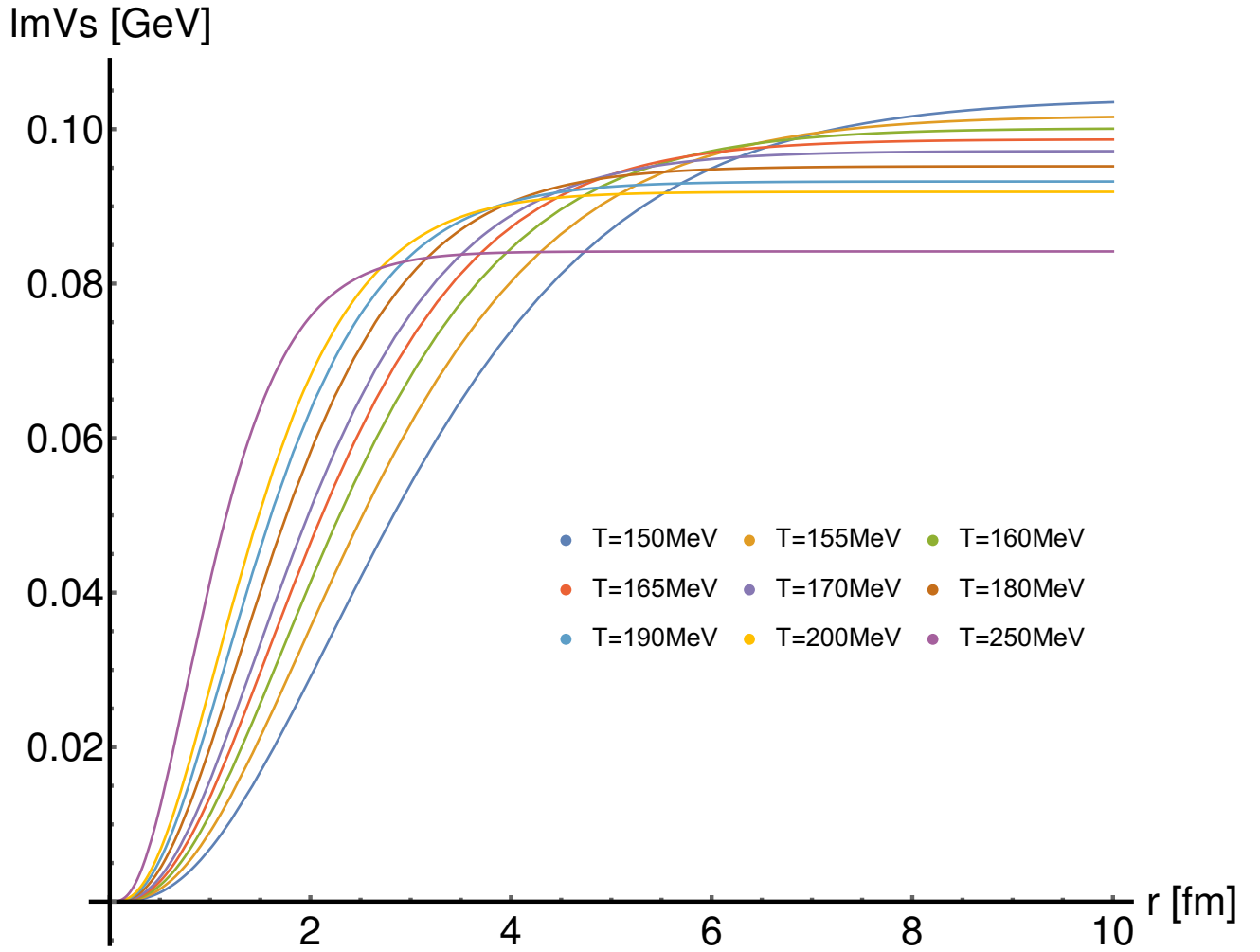


Figure 3: String imaginary part of the potential using Eq. (2).

The lattice fits look as follows

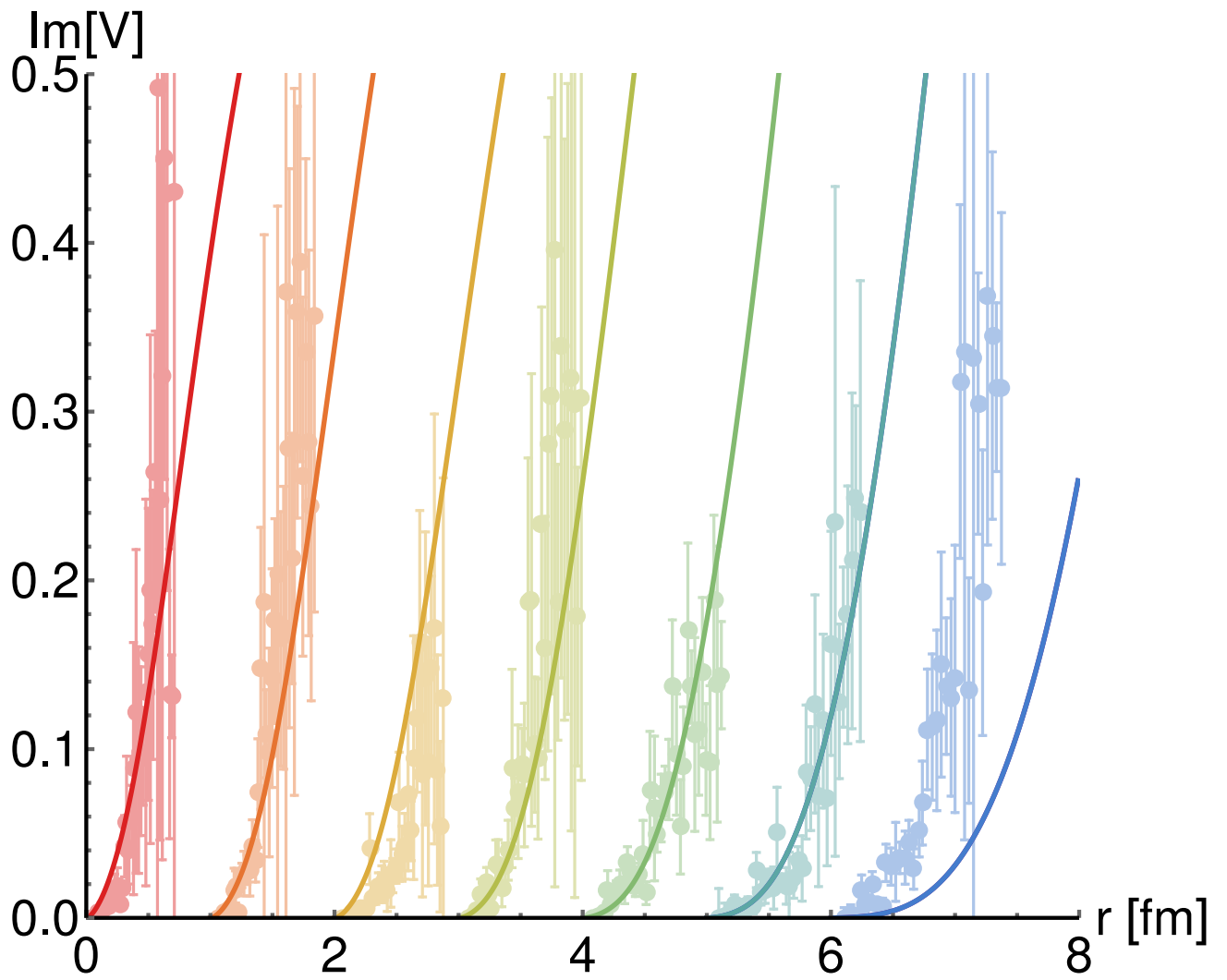


Figure 4: Lattice post-diction of imaginary part of the potential using Eq. (1).

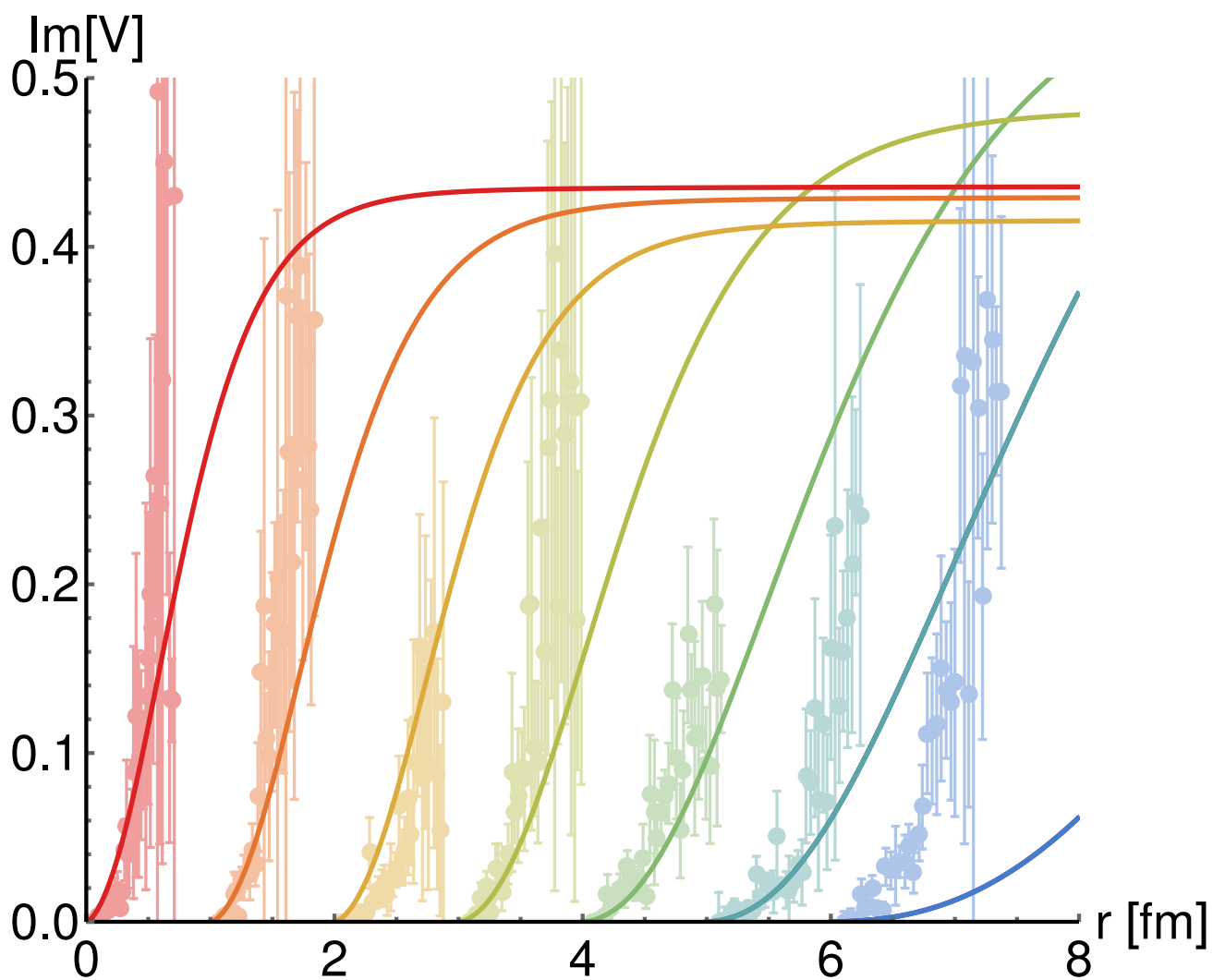


Figure 5: Lattice post-diction of imaginary part of the potential using Eq. (2).

For lower temperatures, the hope was to implement a natural regularisation such that the string imaginary part would flatten off at the thermal string breaking radius r_{sb} , defined as the separation at which the real part of the potential crosses the vacuum threshold for pair creation. However, in both cases this would require a distastefully large regulator.

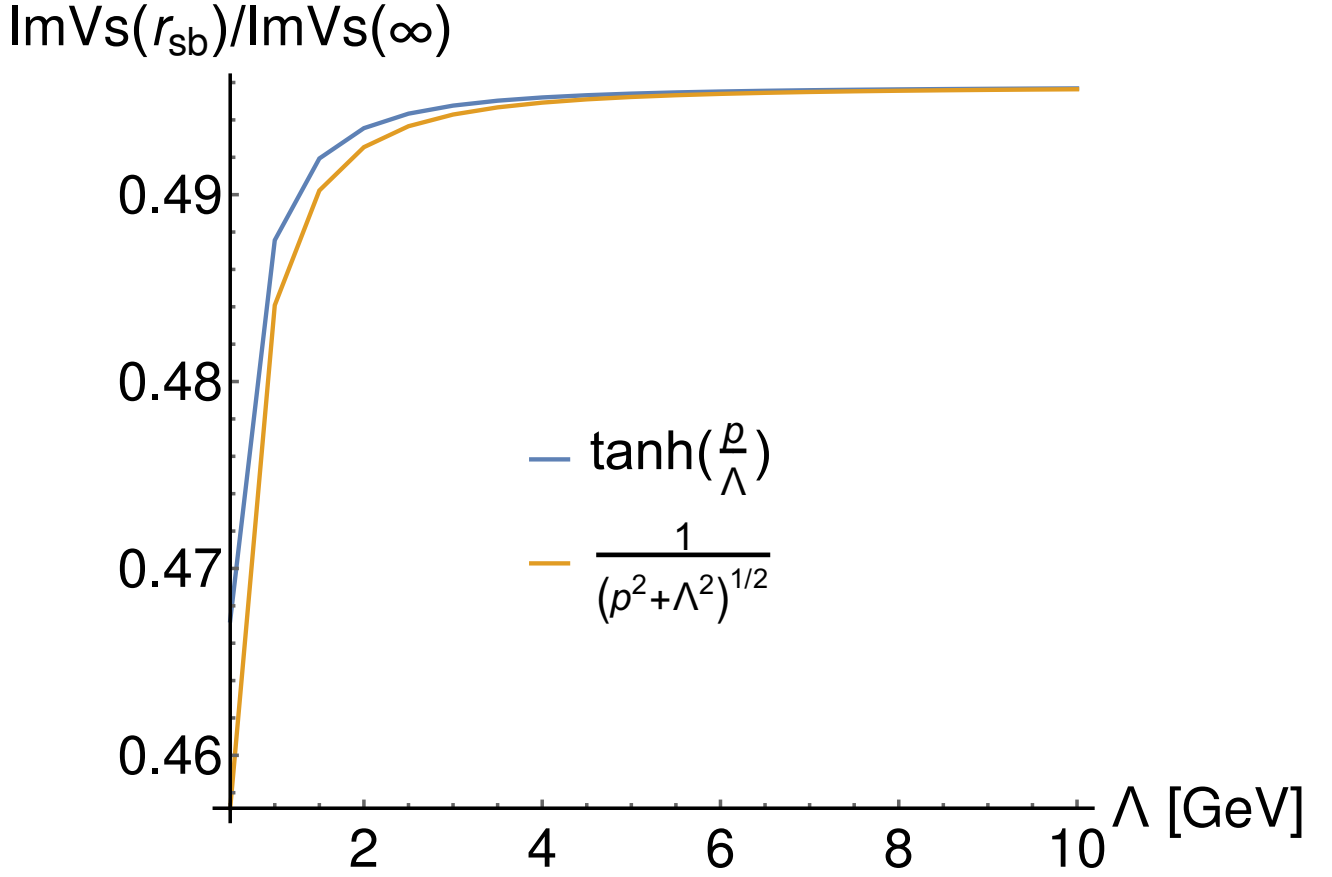


Figure 6: Not quite there.