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The relation between cross section, decay width and imaginary potential of heavy quarkonium in a quark-gluon plasma

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Computations with weakly-coupled plasmas and some lattice results suggest that the heavy quarkonium potential has an imaginary part that is important in order to study dissociation. This imaginary part is due to the inelastic scattering with partons in the medium. At temperatures much below dissociation another process that is known to be important is the so-called gluo-dissociation. The aim of this work is to clarify in a perturbative framework the relation of the different expressions for the quarkonium cross sections that can be found in the literature with the quarkonium thermal width. Finally, with the use of effective field theories we evaluate the quasi-free and gluo-dissociation cross sections in a wide range of temperatures ranging from the binding energy to the dissociation temperature.

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