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Charizard to charmonium: the de-evolution of quarkonia through pion emission

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Have you ever wondered what Pokémon and particle physics have in common? I did. So let me take you along my journey to becoming a true Particle Master. Like any respectable Pokémon adventure, it all starts with choosing your first particle. Mine is charmonium (Charmander best gen 1 starter). Before sending it into battle, the most important thing is to understand its properties and behavior.
With the help of the Born–Oppenheimer Effective Field Theory, we can map out the energy levels and wave-functions of these heavy quark states. But the real fun begins when we ask: how do they evolve, or sometimes de-evolve, by emitting pions? To model this, one could use the classic multipole expansion, but I've chosen a different path: the QCD string description. By building the right Lagrangian, we gain insight into pion scattering, quarkonium transitions, and maybe even unlock the way to finally get a Charizard (or at least a decent approximation of one).

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