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Heavy quark diffusion coefficients and thermal quarkonium mass shifts from lattice QCD

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We will present recent results on thermal modifications of heavy quark spectral functions and transport properties based on continuum extrapolated charmonium and bottomonium correlation functions in pure $SU(3)$ plasma, extending the previous study in the pseudoscalar channel to the vector channel. Using the gradient flow technique for the color-electric field correlator on large and fine lattices in the quenched approximation as well as in full QCD with physical light quark degrees of freedom, we will discuss the effects of dynamical fermions on the heavy quark momentum diffusion coefficient and provide first estimates on the thermal quarkonium mass shift of heavy quarks in the thermal medium. Furthermore we will extend our previous estimation of the heavy quark momentum diffusion coefficient to a wider temperature range relevant for the phenomenology of heavy quark transport in the QGP medium.

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