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Heavy-Quark diffusion in the Quark-Gluon Plasma HENDRIK VAN HEES, Texas A&M University, College Station, Texas, MASSIMO MANNARELLI, Instituto de Ciencias del Espacio, Bellaterra (Barcelona), Spain, VINCENZO GRECO, Dipartimento di Fisica e Astronomia, Catania, Italy, RALF RAPP, Cyclotron Institute and Physics Department, Texas A&M University, College Station, Texas — The Quark-Gluon Plasma (QGP) is a hot and dense state of matter predicted by Quantum Chromo Dynamics (QCD) to exist at temperatures above T 200MeV ($\sim 10^{12}$ Kelvin). The QGP is believed to have prevailed in the first few microseconds after the big bang. Experiments at the Relativistic Heavy Ion Collider (RHIC) are trying to recreate, for a short moment, the QGP in the laboratory. It has been found that the matter produced in high-energy Au-Au collisions is a strongly coupled quark-gluon liquid with very low viscosity and high opacity. To understand the properties of this strongly coupled QGP (sQGP) heavy quarks (charm and bottom) are a particularly valuable probe: they are produced early in the reaction and subsequently diffuse in the putative sQGP. In this talk we develop a model for nonperturbative interactions between heavy and light quarks in the sQGP and apply it to experimental spectra at RHIC. Good agreement with data allows for a quantitative estimate of the heavy-quark diffusion coefficient in the sQGP.

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