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Isospin diffusion in thermal AdS/CFT with flavor

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Using a generalization of the AdS/CFT correspondence, it is possible to determine thermodynamic properties of strongly coupled field theories. Aiming for a description of the characteristics of systems such as the quark gluon plasma, we study the gauge/gravity dual of a finite temperature field theory at finite isospin chemical potential. Therefore we introduce a probe of two coincident D7-branes in the AdS-Schwarzschild black hole background. The isospin chemical potential is obtained by giving a vev to the time component of the non-Abelian gauge field on the brane. The gauge/gravity duality allows to obtain SU(2) flavor current correlators by examining gauge field fluctuations. We discuss the properties of these correlators which go beyond linear response theory. In particular, we show that the isospin chemical potential leads to a frequency-dependent isospin diffusion coefficient.

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