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Charm quark directed, elliptic flows and diffusion coefficient from a multiphase transport model XINYUE JU, University of Science and Technology of China — Open charm meson directed flow (v_1) and elliptic flow (v_2) is studied in relativistic heavy-ion collisions based on a multiphase transport model (AMPT) framework with partonic interactions. The key physics questions we would like to address are how charm quark v_1 and v_2 are developed in the parton cascade and how they are sensitive to the initial condition and charm quark spacial diffusion coefficient. We study the time evolution of charm quark v_1 and v_2 in the partonic phase and compare them with those of light flavor quarks. We find that the charm quark with initial p_x¿0 (p_x¡0) can preserve the large positive (negative) v_1 through the partonic cascade, suggesting charm quarks can retain the momentum kick caused by initial electro-magnetic field. Charm quark spatial diffusion coefficient is calculated and its dependence on partonic scattering cross section as well as its time evolution are studied to help understand how they get manifested in the v_1 and v_2 observables. These findings are expected to guide us on how to better constrain the initial tilt of the fireball and the temperature dependence of charm quark diffusion coefficient in ultra-relativistic heavy-iron collisions.

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