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Collective excitations in anisotropic quark-gluon-plasma

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The quark-gluon plasma at the early stage of relativistic heavy-ion collisions is strongly anisotropic. We systematically study spectrum of collective excitations of such a plasma which is a fundamental characteristic of any many-body system. We demonstrate how the spectrum evolves when the momentum distribution of plasma constituents changes from the extremely prolate –infinitely elongated along the beam direction, through the isotropic one to the extremely oblate –infinitely squeezed in the beam direction. We discuss when unstable modes show up and when they disappear; their role in the plasma dynamics is also considered.

Primary author: DEJA, Katarzyna (National Centre for Nuclear Research)

Co-authors: Prof. CARRINGTON, Margaret (Department of Physics, Brandon University); MROWCZYNSKI, Stanislaw (Jan Kochanowski University)

Presenter: DEJA, Katarzyna (National Centre for Nuclear Research)

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