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Energy loss in unstable quark-gluon-plasma

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The quark-gluon plasma at the early stage of relativistic heavy-ion collisions is unstable due chromomagnetic plasma modes. The energy loss per unit path length of a fast parton scattering elastically in such a plasma is studied as an initial value problem. Although the approach is designed to study the unstable plasma, the well known results of equilibrium plasma are also reproduced. The energy loss in unstable QGP is shown to have strong time and directional dependence. Since the magnitude of the energy loss per unit length in an unstable QGP can be much bigger than in an equilibrium plasma, the problem is important for jet quenching in relativistic heavy-ion collisions.

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