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Instabilities in non-Abelian plasmas

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Quark-gluon plasma, in spite of its non-Abelian dynamics, reveals some similarities to electromagnetic plasmas. In particular, there is a rich spectrum of instabilities which appear to be important to understand a fast equilibration of the quark-gluon plasma produced at the early stage of relativistic heavy-ion collisions. Experimental data suggest that such a plasma reaches equilibrium within 1 fm/c and inter- parton collisions seem to be "slow." However, due to anisotropic momentum distribution, the parton system is unstable with respect to the chromo-magnetic plasma modes. These color instabilities, which are known in the electromagnetic plasmas as the Weibel instabilities, effectively isotropize the system and thus speed up the process of equilibration.