Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Yet another instability in glasma SHOICHIRO TSUTSUI, HIDEAKI IIDA, TEIJI KUNIHIRO, Kyoto University, AKIRA OHNISHI, Yukawa Institute for Theoretical Physics — In relativistic heavy ion collisions (HIC), hydrodynamic models can describe many experimental data and suggest that the quark-gluon plasma formed at RHIC and LHC is almost perfect fluid. We need very short thermalization time and far-from-equilibrium dynamics may be important in thermalization processes of HIC. In the earliest stages of HIC, classical gluon dynamics is dominant and many types of instabilities emerge there. These instabilities may strongly affect the later stages of dynamics; realization of chaoticity and field-particle conversions. We investigate instabilities of classical gluon fields under the homogeneous, but time dependent background color magnetic fields. The background field become periodic function of time and we can analyze the stability of fluctuations based on the Floquet theory which consists the basis of the Bloch theory. As a result, we get the complete structure of instability bands for physical degrees of freedom appearing from parametric resonance. We also find that the parametric instabilities considered here have different natures from the several known instabilities; Weibel and Nielsen-Olesen instabilities. We also discuss some implications of parametric resonance to the particle productions in HIC.

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Date submitted: 01 Jul 2014 Electronic form version 1.4