

High frequency limit for Einstein equations with a $U(1)$ symmetry.

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In the high frequency limit, solutions to Einstein vacuum equations may converge to a solution to Einstein equations coupled to some energy momentum tensor. This effect is called backreaction, and has been studied by physicists (Isaacson, Burnett, Green and Wald). It has been conjectured by Burnett, under some definition of the high frequency limit, that the only effective energy momentum tensor that could appear corresponds to a massless Vlasov field, and that reciprocally all solutions to Einstein equations coupled to a massless Vlasov field can be approached by a sequence of solutions to Einstein vacuum equations (with higher and higher frequencies oscillations). I will present a work in collaboration with Jonathan Luk around Burnett conjecture and its converse.