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Title: Dispersive estimates for the Einstein-Yang-Mills fields with small data

Abstract:

I will present the Einstein-Yang-Mills system in both the Lorenz gauge and in wave coordinates, where the Yang-Mills fields are valued in any arbitrary Lie algebra, associated to any compact Lie group. This gives a system of hyperbolic partial differential equations that does not satisfy the null condition and that has new complications that are not present for the Einstein vacuum equations nor for the Einstein-Maxwell system. We then prove exterior dispersive estimates for initial data close to the Minkowski data, for the evolution problem governed by the fully coupled Einstein-Yang-Mills system in the Lorenz gauge, valued in any arbitrary Lie algebra, without any assumption of spherical symmetry. This provides a first detailed proof of the exterior stability of the Minkowski space-time governed by the fully non-linear Einstein-Yang-Mills equations in both the Lorenz and harmonic gauges.