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Implementation of Recursion Relations in Gluon Scattering Amplitude Calculations in AdS_4/CFT_3[1] NIKOLAOS DOKMETZOGLOU, Davidson College, SAVAN KHAREL, Yale University — The Anti-de Sitter/Conformal Field Theory (AdS/CFT) correspondence is a duality between a theory of gravity in curved-space (AdS) and a conformally-invariant quantum field theory in flat-space (CFT). Scattering amplitudes are observables associated with the probability of the interaction of a given assembly of particles. Gluons, being the exchange particles associated with the strong nuclear force, which holds quarks together to form protons, are abundant byproducts of fundamental particle collisions. Thus, studying gluon scattering amplitudes is an effective way of deepening our understanding of these observables in AdS/CFT. Traditionally, Feynman diagrams have been used to calculate such scattering amplitudes. In this project, we use factorization properties and recursion relations to simplify these calculations. More specifically, we calculate multiple (different helicity combinations) four-point gluon scattering amplitudes in AdS_4/CFT_3 (4-D AdS and 3-D CFT) as sums of products of three-point amplitudes. And then we calculate a five-point gluon scattering amplitude in AdS_4/CFT_3 by decomposing it into a sum of products of these four-point and three-point amplitudes. Finally we comment on useful identities for checking these amplitudes.

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