This article studies couplings between gauge and gravitational fields by use of relations between tree amplitudes of open and closed strings. In a previous paper [1] (MR2556162), the authors obtain a relation for strings defined on a disk D_2, modifying the well-known Kawai-Lewellen-Tye (KLT) relation [2] for strings defined on a sphere S^2. In this article, the authors argue that use of the disk relation can leads to tree amplitudes of gluons that are minimally coupled to gravitons. Explicit expressions for three- and four-point amplitudes are given. Generalizations of the argument for multi-point amplitudes with arbitrary helicity configurations are also presented.

References

[1] Y. X. Chen, Y. J. Du and Q. Ma, Nucl. Phys. B **824**, 314 (2010) [arXiv:0901.1163 [hep-th]].

[2] H. Kawai, D. C. Lewellen and S. H. H. Tye, Nucl. Phys. B **269**, 1 (1986).