

Evidence for dark gluon bremsstrahlung in three dark showers event

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Exporting dark QCD via different portal models at the LHC is an exciting prospect. As we known, the dark gluon(g_v) is an indispensable ingredient in dark QCD. However, the popular two dark showers event with two dark quarks ($q_v \bar{q}_v$) in the final state cannot directly look for the evidence of dark gluon at the LHC. Inspired from the $e^+e^- \rightarrow q\bar{q}g$ process at lepton colliders for the three jet event, we propose to search the three dark showers event ($q_v \bar{q}_v g_v$) at the LHC for the evidence of dark gluon. Furthermore, the three dark showers event may also indicate the spin of dark gluon via the type of Ellis–Karlner angle and distinguish the production mode either from s-channel portal or t-channel portal.

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