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**$\gamma$ and $\pi^0$-Hadron Correlations in Heavy Ion Collisions at the LHC with ALICE** MICHAEL OLIVER, Yale University, ALICE COLLABORATION — In ultra-relativistic heavy ion collisions, direct photons from hard-scatters do not interact with the strongly interacting quark-gluon plasma, providing a clean probe into hard-scatter kinematics. Thus, correlations between direct photons and hadrons from an away-side jet are not subject to any trigger bias due to quenching of the trigger, allowing an unambiguous measurement of the modification of the away-side jet. A major background to these direct photon triggers are decay photons from high momentum neutral pions. The impact of correlations with these pions can be removed by measuring correlations with identified $\pi^0$'s at various transverse momenta, and using kinematics to convert these $\pi^0$-hadron correlations to $\gamma^{decay}$-hadron correlations to subtract these from inclusive $\gamma$-hadron correlations to find true $\gamma^{direct}$-hadron correlations. Using the ALICE Electromagnetic Calorimeter, we detect both the inclusive photon and $\pi^0$ triggers, and correlate them with charged hadrons detected using ALICE's Inner Tracking System and Time Projection Chamber to measure $\gamma^{direct}$-hadron correlations in Pb-Pb collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV. Progress towards this measurement will be shown.

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