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Richness-Mass relation and Optical-SZE Positional Offset Distribution for SPT Selected Clusters ALEXANDRO SARO, Ludwig Maximilian University, DARK ENERGY SURVEY COLLABORATION, SOUTH POLE TELESCOPE COLLABORATION — We cross-match clusters detected via their Sunyaev Zel'dovich effect in the 2500 deg² SPT-SZ survey carried out with the South Pole Telescope (SPT) with optically selected cluster catalogs extracted from the 250 deg² science verification data of the Dark Energy Survey: the RedMaPPer and the Voronoi Tessellation (VT) cluster catalogs. We use SPT derived masses and positions of these systems to characterize the RedMaPPer and VT cluster samples. We calibrate the RedMaPPer richness λ -mass relations for an SPT selected sample and show that it is characterized by low intrinsic scatter $\sim 18\%$, consistent with the λ -mass relation previously estimated by Rykoff et al.(2012), while the resulting VT richness N_{vt} -mass scaling relation is characterized by a larger intrinsic scatter $\sim 64\%$. We extend our matching algorithm to SPT selected cluster candidates with lower signal to noise ($4 < \xi < 4.5$) and show that increasing the matched sample by $\sim 44\%$ with systems that have less well constrained SPT masses only marginally affects a low scatter mass proxy as λ . We study the offset distribution between the SPT-SZ centre and the optical centers and show that it contains both a dominant, centrally peaked population and a sub-dominant population.

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