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Combining large radio and optical astronomical surveys: exploring the MeerKAT Galaxy Cluster Legacy Survey

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We are entering an era of large radio and optical astronomical surveys, particularly for the Southern Hemisphere. One challenge is to effectively combine and cross-match source catalogues from surveys in different wavelengths, thereby maximising the science impact of surveys. We use the Likelihood Ratio method to cross-match compact source catalogues extracted from the MeerKAT Galaxy Cluster Legacy Survey (MGCLS) with optical sources detected in the Dark Energy Camera Legacy Survey (DECaLS). These matched catalogues can now be further explored for various science applications, and to possibly improve the cross-matching method for future surveys. For this presentation, we contrast and test two different methods to evaluate the "Reliability" and "Completeness" of the cross-matching method and the resulting catalogues to determine which method is better suited for optimally combining large radio and optical surveys.

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MSc

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