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A Uniformly Selected, All-Sky Optical AGN Catalog for UHECR Correlation

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Studies discerning whether there is a significant correlation between ultra high energy cosmic ray (UHECR) arrival directions and optical AGN are hampered by the lack of a uniformly selected and complete all-sky optical AGN catalog. To remedy this, we are preparing such a catalog based on the 2MASS Redshift Survey (2MRS), a spectroscopic sample of $\sim 44,500$ galaxies complete to a K magnitude of 11.75 over 91% of the sky. We have analyzed the available optical spectra of these 2MRS galaxies ($\sim 80\%$ of the galaxies), in order to identify the AGN amongst them with uniform criteria. Although the selection is uniform, the spectra were taken with different instruments (the majority from four different observatories). We present not only the catalog but an assessment of its homogeneity and completeness. Correlations between this well-characterized catalog and UHECRs published by the Pierre Auger Observatory and its implications will also be discussed.

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