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Updates on Radio U-Net: application to the full LoTSS survey

Wednesday 28 May 2025 09:15 (15 minutes)

In this talk, I will present the latest developments in the Radio U-Net pipeline. Radio U-Net is a convolutional neural network derived from the U-Net architecture, specifically designed to perform rapid and automated segmentation of diffuse radio emission in extensive low-frequency surveys. Its application to the LOFAR Two Metre Sky Survey (LoTSS) has demonstrated high accuracy: when the segmentation maps are cross-matched with galaxy cluster catalogs, the network successfully recovered 83% of clusters exhibiting diffuse emission in a balanced sample of 246 clusters. These promising results have motivated the application of Radio U-Net to the entire LoTSS survey, which is scheduled for release in Summer 2025. We are currently refining the automatic pipeline with the ambitious goal of detecting diffuse radio emissions across a sample of approximately 3,000 galaxy clusters. I will show the achieved results and forecast the nextfinal steps to conclude our work. I will show the achieved results and forecast the final steps to conclude our work.

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