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Investigating the Relationship of Luminosity and Curvature Using the Luminous Convolution Model for Spiral Galaxy Rotation Curves

MEAGAN CROWLEY, University of Massachusetts Boston — The Luminous Convolution Model maps velocities of galaxies given by data of visible matter with respect to the relative curvature of the emitter and receiver galaxy using five different models of the Milky Way. This model purports that observations made of the luminous profiles of galaxies do not take the relative curvatures of the emitter and receiver galaxies into account, and thus maps the luminous profile onto the curvature using Lorentz transformations, and then back into the flat frame where local observations are made. The five models of the Milky Way used to compile galaxy data are proposed by Klypin:Anatoly (2002) A and B, Xue (2008), Sofue (2013), and a mixture of Xue and Sofue data. The Luminous Convolution Model has been able to accurately describe the rotation of spiral galaxies through this method without the need for dark matter. In each fitting of a given galaxy, the luminous profile graph exhibits a crossing with the graph of the curvature component, suggesting a correlation between the two. This correlation is currently under investigation as being related to phenomena apparent within each galaxy. To determine the correlation between the luminous profile and the curvature component, a functional analysis of the Luminous Convolution Model will be presented

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