Spiral Galaxy Central Bulge Tangential Speed of Revolution Curves LAURENCE TAFF[1], Taff and No Associates — The objective was to, for the first time in a century, scientifically analyze the "rotation curves" (sic) of the central bulges of scores of spiral galaxies. I commenced with a methodological, rational, geometrical, arithmetic, and statistical examination—none of them carried through before—of the radial velocity data. The requirement for such a thorough treatment is the paucity of data typically available for the central bulge: fewer than 10 observations and frequently only five. The most must be made of these. A consequence of this logical handling is the discovery of a unique model for the central bulge volume mass density resting on the positive slope, linear, rise of its tangential speed of revolution curve and hence—for the first time—a reliable mass estimate. The deduction comes from a known physics-based, mathematically valid, derivation (not assertion). It rests on the full (not partial) equations of motion plus Poisson's equation. Following that is a prediction for the gravitational potential energy and thence the gravitational force. From this comes a forecast for the tangential speed of revolution curve. It was analyzed in a fashion identical to that of the data thereby closing the circle and demonstrating internal self-consistency. This is a hallmark of a scientific method-informed approach to an experimental problem. Multiple plots of the relevant quantities and measures of goodness of fit will be shown.

[1]Astronomy related

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