## A First Step in Evolving Quantum Cosmology

U. V. S. Seshavatharam<sup>1</sup> and S. Lakshminarayana<sup>2</sup>

<sup>1</sup>Honorary Faculty, I-SERVE, S. No-42, Hitex Road, Hitech City, Hyderabad-84, Telangana, India. <sup>2</sup>Department of Nuclear Physics, Andhra University, Visakhapatnam-03, AP, India. Email(s): Seshavatharam.uvs@gmail.com (and) Lnsrirama@gmail.com

Abstract: Implementing Mach's principle and Planck scale simultaneously in entire cosmic evolution can be considered as a first step in quantum cosmology. In this context, we propose a simple model of quantum cosmology without dark energy. Our assumptions are: 1) Universe is a quantum gravitational object. 2) Planck scale and Mach's principle play a combined role in entire cosmic evolution. 3) Cosmic thermal wavelength is inversely proportional to ordinary matter density ratio. 4) Ordinary matter density ratio and dark matter density ratio play a combined role in estimating cosmic expansion velocity. 5) Critical energy density and dark energy density are equal in magnitude and physically there exists no dark energy.

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