In the name of God

Department of Physics
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ADVANCED TOPICS IN MODER COSMOLOGY

Exercise Set 3

(Date Due: 1393/01/30)

1. Compute the following quantities:

    A : How much is 1 Astronomical unit, (Au), in unit of *meter*.

    B : Compute 1 parsec in units of *meter* and *Au*.

    C : What are the rough estimation size of **solar system**, **our galaxy**, **local group**, the size of observable universe? Write each values in units of *meter*, *Au* and *Pc*.

2. Extract continiuity and Euler equations from energy-momentom tensor.

3. Solve the exercise 4.1 of book "Spacetime and Geometry" by Sean Carroll. (Equation of motion for electromagnetic Lagrangian)

4. Calculate $\delta\sqrt{-g}$. Where $g \equiv Det(g_{\mu\nu})$.

5. Using first equation of Fridmann and continuity equation to find equation for acceleration.

Good luck, Movahed

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