Third-Body Perturbation Using Single Averaged Model: Application to Lunisolar Perturbations

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Abstract: In this paper, we considered the third-body perturbation using a single averaged model to study the effect of lunisolar perturbations on high-altitude Earth satellites. We combine two third-body perturbations. If no resonance occurs with the Moon or the Sun, short period terms are eliminated. In this way, we developed a semi-analytical study of the perturbation caused in a spacecraft by a third body with a single averaged model to eliminate the terms due to the short time periodic motion of the spacecraft. Several plots will show the time histories of the Keplerian elements.