Review on Satellite Orbit Determination Based on Stahel–Donoho Kernel Estimator

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Abstract—Review on Satellite Orbit Determination Based on Stahel–Donoho Kernel Estimator. Discuss the Strengths and Weaknesses of the methodology to estimate the orbit with Model error compensation technology.

Index Terms—Orbit Estimation,, Orbital Dynamic Model, Stahel-Donoho kernel estimator, model error compensation.

I. INTRODUCTION

This document discuss the topic related Kernel based satellite orbit determination. In this orbit determination mainly contains three steps. First one is orbit determination model, second is kernal estimation of the model error and third step is Depth-Weight kernel estimation. Here Estimating the orbit of a satellite with dyamic model compensation.

II. STRENGTHS OF PAPER [1]

Strengths of Satellite Orbit Determination Based on Stahel–Donoho Kernel Estimator as follows :

- Stahel–Donoho Kernel Estimator is a Non-Linear estimation technique.
- Estimation algorithm estimate the satellite orbit pricisely even for low presicion dynamical model
- Derived Dynamical model from observation contains the un modelled forces
- Predicted Observations are very accurate
- Kernal estimation estimate the model error in two stages and kernal function have excellent large sample property.
- Depth weight kernal estimation improve estimation method is very robust [2]
- Estimation technique algorithm ensure convergence and better stability

III. WEAKNESSES OF PAPER [1]

Weaknesses of Satellite Orbit Determination Based on Stahel–Donoho Kernel Estimator as follows :

- Stahel–Donoho Kernel Estimator computational intensive, diffcult in impliemnting the real time orbit determination system.
- This algoritms required high precission measurements.
- This paper [1] simulations are compared with TLE elemnts which is not accurate.
- No information discussed about Gauss-noise.
- Limitation of estimation algorithm not discussed.

- Constructed the partially linear orbit determination model for model error in paper [1]

REFERENCES

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[2] Pan XG, Zhou HY. The data depth-weight-kernel estimation of the model error of satellite orbit determination. Chinese Astronomy and Astrophysics. 2009 Jul 1;33(3):293-304.