R006-36
A 会場 ：11/7　PM1 （13:45-15:30）
14:15〜14:30

ベイズ推定を活用したプラズマ波動の伝搬方向推定手法の詳細評価

#田中　裕士[1)], 太田　守[2)], 松田　昇也[1)], 笠原　禎也[1)]
[(1] 金沢大,[(2] 富山高専

Detailed Evaluation with Bayesian k-vector Estimation Method for Plasma Waves

#Yuji Tanaka[1)], Mamoru Ota[2)], Shoya Matsuda[1)], Yoshiya Kasahara[1)]
[(1]Kanazawa Univ.,[(2]National Institute of Technology, Toyama College

The analysis of plasma waves obtained from in-situ observation by scientific satellites is effective for understanding the physics of near-Earth space and space plasmas in general. k-vector direction of plasma waves, using plasma wave characteristics and remote sensing technology, provides information for understanding the global features of space plasma.

k-vector direction is generally estimated from a spectral matrix, which is the electromagnetic field's correlation matrix. Ideally, determining the k-vector direction including the absolute direction requires the observation results of at least 5-electromagnetic field components. However, there is often a need for k-vector direction estimation in situations where some sensors are missing due to sensor damage or some constraints of the scientific satellites. Further, k-vector should be estimated with different sensor noise levels.

In this study, we introduce a k-vector estimation method based on the wave distribution function method [Storey+, 1979, Storey+, 1980]. The method is based on the Bayesian inference, so the extent of estimation accuracy can easliy visualized. Using this method, we evaluated the extent of estimation accuracy considering the number of sensors and the noise integration kernel [Tanaka+, 2021].

References

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