

Review report of the article ‘NORMAL OPERATORS FOR MOMENTUM RAY
TRANSFORMS, II: SAINT VENANT OPERATORS’

The present paper proves an explicit inversion formula for recovering a generalized Saint-Venant operator from the incomplete normal operator. This work generalizes the authors’ previous result in [1], where they established an inversion formula for recovering a symmetric tensor field f from the data (N_1f, \dots, N_mf) . Here, $N_p f = (I^p)^* I^p$ for $0 \leq p \leq m$, where I^p denotes the p -th momentum ray transform.

While the main result of this paper is correct and the proof techniques are rigorous, I find that the motivation for studying $N_p f = (I^p)^* I^p$ is not clear in the paper. The mathematical exposition is impeccable, the paper is well-written, with no apparent typographical or mathematical errors in any of the derivations.

The paper provides an inversion formula for $W^k f$ in terms of (N_1f, \dots, N_kf) where $k < m$. However, it does not address which components of a tensor f can actually be recovered from this data. It would strengthen the paper if the authors could provide some insight into this aspect. It will be good if the author provides some application of partial momentum ray transform as well.

Recommendation: Despite the minor concern about motivation, I find the results are technically sound. Therefore, I recommend this paper for publication.

REFERENCES

- [1] S. R. JATHAR, M. KAR, V. P. KRISHNAN, AND V. A. SHARAFUTDINOV, *Normal operators for momentum ray transforms, i: The inversion formula*, Journal of Fourier Analysis and Applications, 30 (2024).