

Referee Report for "Concerning the detection of electromagnetic knot structures in space plasmas using the wave telescope technique" by S. Toepfer, K.-H. Glassmeier and U. Motschmann

In this paper the authors make a very interesting contribution to the methodology for analysing space plasma data by extending the wave telescope technique by combining it with a new set of exact solutions of Maxwell's equations. The wave telescope technique has been originally based on plane wave solutions of Maxwell's equations, but various authors have extended it to different solution spaces. In the present paper, the authors propose to use the localized solutions of Maxwell's equations presented in a paper by R. P. Cameron in 2018 as the basic solutions of Maxwell's equations to be used in the wave telescope method. This is a novel and innovative approach and the application to plasmoids presented in the paper seems to indicate that it has considerable future potential.

I find this paper to be scientifically of high quality and very well written. For example, I did not find any obvious typographical errors and I believe the mathematical derivations are also correct.

I have only one point of clarification that I would like the authors to address. The "classical" wave telescope methods are based on the superposition of solutions of Maxwell's equations that are mathematically complete, i.e. all functions within a certain function space can be represented as a sum or integral over the basis functions. In the discussion in the Introduction the authors seem to imply that Cameron's knot solutions also form a complete basis for the function space to be considered, but that is not obvious from either Cameron's original paper, nor does it become completely clear from the analysis presented in the paper. While it is clear that Cameron's solutions can be written as superpositions of plane wave solutions, it is not entirely clear to this referee that the inverse is also true, and it would have to be if one is really considering this to be a change of basis functions. This may, however, not be crucial for making the method applicable to data analysis, but a clarification might help readers who could be interested in using this method.