Abstract Submitted
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Time-spectral modelling of drift wave turbulence JAN SCHEFFEL, Dept of Fusion Plasma Physics, KTH Royal Institute of Technology, Stockholm, Sweden — Time spectral methods for initial-value partial differential equations avoid the time stepping being characteristic for temporal finite difference schemes. Large gains in efficiency should then be within reach for problems in plasma physics with widely separated time scales. In the recently developed Generalized Weighted Residual Method GWRM [1], temporal, spatial and parameter domains are all handled using a Chebyshev polynomial solution ansatz. The coefficients of the ansatz are determined using a generalized weighted residual method, for which a new efficient equation system solver has been applied [2]. In addition, subdomain methods for the temporal and spatial domains have been developed [3] and employed successfully in a number of test problems. We will here also present a related method, being based on least square minimization of the residual rather than on the Galerkin method. Both methods are applied to problems in drift wave turbulence from which results will be presented.

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[2] Scheffel J and Håkansson C, Appl. Numer. Math. 59(2009)2430.
[3] Scheffel J and Mirza A, Am. J. of Comp. Math. 2(2012)72.

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