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Frank Jochmann* (jochmann@math.tu-berlin.de), Institut fuer Mathematik, Fakultat II, TU-Berlin, Strasse des 17. Juni 136, 10623, Berlin, Germany. *On Bean's critical state model for superconductors.*

This talk is concerned with Bean's critical state model for the description of the electromagnetic field in superconductors where the displacement current is not neglected. The studied system consist of Maxwell's equations where the electric field and the current density satisfy a nonlinear current-voltage relation. For the purpose of generality, not only Maxwell's equations but a a wider class of first-order systems is considered that includes the scalar wave equation with generally nonlinear multivalued damping. The long-time asymptotic behavior of the solutions in the case where the spatial domain may be arbitrary and has finite measure is discussed.

Furthermore, the case where the displacement current is neglected only on a subset of the spatial domain is considered. For this mixed-type problem, a variational formulation of problem is given and it is shown that this problem supplemented by certain initial-boundary conditions is uniquely solvable. (Received August 26, 2008)