cases

doc_1		doc_2		decision	id
authors	• Adler, J. H. • Benson, T. • Cyr, E. C. • Farrell, P. E. • MacLachlan, S. • Tuminaro, R.	**authors**	• J. H. Adler • T. Benson • E. C. Cyr • P. E. Farrell • S. MacLachlan • R. Tuminaro	DUPLICATES	94
title	Monolithic Multigrid for Magnetohydrodynamics	**title**	Monolithic Multigrid for Magnetohydrodynamics		
publication_date	2020-06-28 00:00:00	**publication_date**	2020-06-28 20:18:56+00:00		
source	SupportedSources.CORE	**source**	SupportedSources.ARXIV		
journal		**journal**	None		
volume		**volume**			
doi	None	**doi**			
urls	• http://arxiv.org/abs/2006.15700	**urls**	• http://arxiv.org/pdf/2006.15700v1 • http://arxiv.org/abs/2006.15700v1 • http://arxiv.org/pdf/2006.15700v1		
id	id1889631123383738574	**id**	id7688150158271023132		
abstract	The magnetohydrodynamics (MHD) equations model a wide range of plasma physics applications and are characterized by a nonlinear system of partial differential equations that strongly couples a charged fluid with the evolution of electromagnetic fields. After discretization and linearization, the resulting system of equations is generally difficult to solve due to the coupling between variables, and the heterogeneous coefficients induced by the linearization process. In this paper, we investigate multigrid preconditioners for this system based on specialized relaxation schemes that properly address the system structure and coupling. Three extensions of Vanka relaxation are proposed and applied to problems with up to 170 million degrees of freedom and fluid and magnetic Reynolds numbers up to 400 for stationary problems and up to 20,000 for time-dependent problems	**abstract**	The magnetohydrodynamics (MHD) equations model a wide range of plasma physics applications and are characterized by a nonlinear system of partial differential equations that strongly couples a charged fluid with the evolution of electromagnetic fields. After discretization and linearization, the resulting system of equations is generally difficult to solve due to the coupling between variables, and the heterogeneous coefficients induced by the linearization process. In this paper, we investigate multigrid preconditioners for this system based on specialized relaxation schemes that properly address the system structure and coupling. Three extensions of Vanka relaxation are proposed and applied to problems with up to 170 million degrees of freedom and fluid and magnetic Reynolds numbers up to 400 for stationary problems and up to 20,000 for time-dependent problems.		
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