cases	doc_1		doc_2		decision	id
			authors	• Oliver Lindblad Petersen	DUPLICATES	73
	authors	• Oliver Lindblad Petersen	**title**	On the Cauchy problem for the linearised Einstein equation		
	title	On the Cauchy Problem for the Linearised Einstein Equation	**publication_date**	2018-02-16 00:00:00		
	publication_date	2019-10-21 00:00:00	**source**	SupportedSources.INTERNET_ARCHIVE		
	source	SupportedSources.SEMANTIC_SCHOLAR	**journal**			
	journal	Annales Henri PoincarÃ©	**volume**			
	volume	20	**doi**			
	doi	10.1007/s00023-019-00857-5	**urls**	• https://web.archive.org/web/20200930175331/https://arxiv.org/pdf/1802.06028v1.pdf		
	urls	• https://www.semanticscholar.org/paper/2001e12f7e0230692214fa09f44bbfea6faf795f	**id**	id89326335402256881		
	id	id5351947823019649834	**abstract**	A classical problem in general relativity is the Cauchy problem for the linearised Einstein equation (the initial value problem for gravitational waves) on a globally hyperbolic vacuum spacetime. A well-known result is that it is uniquely solvable up to gauge solutions, given initial data on a spacelike Cauchy hypersurface. The solution map is an isomorphism between initial data (modulo gauge producing initial data) and solutions (modulo gauge solutions). In the first part of this work, we show that the solution map is actually an isomorphism of locally convex topological vector spaces. This implies that the equivalence class of solutions depends continuously on the equivalence class of initial data. We may therefore conclude well-posedness of the Cauchy problem. In the second part, we show that the linearised constraint equations can always be solved on a closed manifold with vanishing scalar curvature. This generalises the classical notion of TT-tensors on flat space used to produce models of gravitational waves. All our results are proven for smooth and distributional initial data of arbitrary real Sobolev regularity.		
	abstract	None	**versions**			
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