cases	doc_1	doc_2	decision	id
authors	• LÃ©o Bois • Emmanuel Franck • Laurent Navoret • Vincent Vigon	• LÃ©o Bois and Emmanuel Franck and Laurent Navoret and Vincent Vigon	DUPLICATES	227
title	A neural network closure for the Euler-Poisson system based on kinetic simulations	A neural network closure for the Euler-Poisson system based on kinetic simulations		
publication_date	2021-01-01 00:00:00	2020-11-12 00:00:00		
source	SupportedSources.INTERNET_ARCHIVE	SupportedSources.INTERNET_ARCHIVE		
journal	American Institute of Mathematical Sciences (AIMS)			
volume				
doi	10.3934/krm.2021044			
urls	• https://web.archive.org/web/20220116042213/https://www.aimsciences.org/article/exportPdf?id=7a7c6773-7741-445e-a1fb-c3153eeece8d	• https://web.archive.org/web/20201114131059/https://arxiv.org/pdf/2011.06242v1.pdf		
id	id7761911467049269061	id4246351136734204043		
abstract	<p style='text-indent:20px;'>This work deals with the modeling of plasmas, which are ionized gases. Thanks to machine learning, we construct a closure for the one-dimensional Euler-Poisson system valid for a wide range of collisional regimes. This closure, based on a fully convolutional neural network called V-net, takes as input the whole spatial density, mean velocity and temperature and predicts as output the whole heat flux. It is learned from data coming from kinetic simulations of the Vlasov-Poisson equations. Data generation and preprocessings are designed to ensure an almost uniform accuracy over the chosen range of Knudsen numbers (which parametrize collisional regimes). Finally, several numerical tests are carried out to assess validity and flexibility of the whole pipeline.</p>	This work deals with the modeling of plasmas, which are charged-particle fluids. Thanks to machine leaning, we construct a closure for the one-dimensional Euler-Poisson system valid for a wide range of collision regimes. This closure, based on a fully convolutional neural network called V-net, takes as input the whole spatial density, mean velocity and temperature and predicts as output the whole heat flux. It is learned from data coming from kinetic simulations of the Vlasov-Poisson equations. Data generation and preprocessings are designed to ensure an almost uniform accuracy over the chosen range of Knudsen numbers (which parametrize collision regimes). Finally, several numerical tests are carried out to assess validity and flexibility of the whole pipeline.		
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