UNIVERZITA KARLOVA
Matematicko-fyzikální fakulta

Zápis o části státní závěrečné zkoušky
Obhajoba diplomové práce

Akademický rok: 2019/2020

Jméno a příjmení studenta:	Brendan Ninneman
Rok narození:	1996
Identifikační číslo studenta:	33052803
Typ studijního programu:	navazující magisterský
Studijní program:	Matematika
Studijní obor:	Matematické modelování ve fyzice a technice
Identifikační čísla studia:	597624
Název práce:	Subsolidus thermal convection as a key to understanding volatile evolution and internal dynamics of large icy bodies
Pracoviště práce:	Department of Geophysics (111. • 32-KG)
Jazyk práce:	angličtina
Jazyk obhajoby:	English
Vedoucí:	RNDr. Klára Kalousová, Ph.D.
Oponent(i):	RNDr. Ondřej Šrámek, Ph.D.
Datum obhajoby:	09.07.2020 **Místo obhajoby:** Praha
Průběh obhajoby:	In his presentation, Ninemman started with the motivation by describing the problem of cooling of Saturn moon Titan. Equations governing the dynamics and boundary equations are then shown and student introduces the numerical methods including details of finite-element scheme. He continues by testing the implementation against standard Blankenbach benchmark. Student then shows results for ice crust thickening and development of convective cells at certain time. Finally the dependence on parameters - internal heat flux, ammonia concentration in the ocean (influencing thermodynamics relation) is studied. He concludes by discussion of critical value of heat flux to preserve liquid ocean and by the statement that presence of NH3 stabilizes the liquid ocean against freezing. Supervisor presented her evaluation of the thesis. Reviewer has number of questions (see his report) questions 6-10 were discussed in detail. He expressed some reservations considering logical structuring and formulation of some parts of thesis. In general discussion Jan Zeman asked about nature of the spatial scale of the convection cells. Vit Dolejsi wanted student to discuss the details of time step discretization and its relation to stability. Some answers were superficial and did not touch the essence of the issue.

Výsledek obhajoby:	excellent (1)	
Předseda komise:	prof. RNDr. Josef Málek, CSc., DSc.	.....
Členové komise:	doc. RNDr. Martin Čížek, Ph.D.	.....
	Mgr. Vít Průša, Ph.D.	.....
	prof. RNDr. Ondřej Čadek, CSc.	.....
	prof. RNDr. Vít Dolejší, Ph.D., DSc.	.....
	doc. RNDr. Martin Kružík, Ph.D., DSc.	.....
	doc. Mgr. Milan Pokorný, Ph.D.	.....
	prof. Ing. Miroslav Tůma, CSc.	.....
	prof. Ing. Jan Zeman, Ph.D.	.....