

ITC CONFERENCE GRANT SCIENTIFIC REPORT

This report is submitted for approval by the grant to the MC Chair.

Action number: CA15108

Conference title: 14th Vienna Central European Seminar

Conference start and end date: 30/11/2018 to 01/12/2018

Conference attendance start and end date: 30/11/2018 to 01/12/2018

Grantee name: Zoltán Péli

ACTIVITIES DURING YOUR ATTENDANCE AT THIS CONFERENCE:

I have attended the plenary talks on both days of the conference and also listened to the public lecture of Malcolm J. Perry. I have presented a poster in the poster section of the conference. The poster section took place on the second day, from 10:30 to 11:15. The title of my poster is “Stability of the Higgs-vacuum as constraint on U(1) extensions of the Standard Model”. This poster summarizes my current work. In the Standard Model, the quartic scalar coupling becomes negative during its renormalization group flow towards higher energies. This makes the scalar potential unbounded from below, which is physically not acceptable. The U(1) extensions of the Standard Model are popular candidates to explain neutrino masses. The extra couplings of the extended model influence the renormalization group flow of quartic scalar coupling of the Higgs field. I have derived the β -functions of the extended model in one-loop and searched for a region in the parameter space in which the positivity of the Higgs quartic scalar coupling is satisfied up to the Planck scale. I have found a finite region, where this criterion was satisfied. Such analysis could provide a useful basis for models of inflation.

IMPACT ON YOUR RESEARCH AND FUTURE COLLABORATIONS

I am currently researching Beyond Standard Model Physics and there were several talks on the conference on this topic. I have found many of them insightful. My favourite plenary talk was from Astrid Eichhorn with the title “Towards a link between particle physics and quantum gravity”. I’ve got the chance to talk to people in the poster section. They were welcoming and sociable and asked a lot questions about my work. I have found the discussions to be fruitful for my future research. I have conveyed my research to my fellow scientists and by this I believe I’ve increased the impact of my work.