



COMMISSARIAT A L'ENERGIE ATOMIQUE - DIRECTION DES SCIENCES DE LA MATIERE

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Saclay, February 14, 2013

Reference letter for Timon MEDE

Dear Colleagues,

I am writing this letter in support of Timon Mede, who has applied for a postdoctoral position at your institute. I know Timon through my collaboration with him and his advisor, Borut Bajc. I first met him in Ljubljana in 2010, when I was visiting Borut. We worked together on the issue of supersymmetry breaking in Grand Unified Theories and on proton decay. In our first project (arXiv:1202.2845, published in JHEP) we attacked the difficult issue of simultaneous supersymmetry and gauge symmetry breaking. The idea dates back to the inverse hierarchy mechanism of Witten, but it is notoriously difficult to build realistic models with an explicit supersymmetry breaking sector, at least if this sector is weakly coupled. One typically encounters problems with tachyonic contributions to the soft scalar masses, due to the fact that several fields are needed in the symmetry breaking sector. We circumvented this problem by using radiative corrections to create a local gauge and supersymmetry breaking minimum in the effective potential of a single SU(5) adjoint field. Supersymmetry breaking is then transmitted to the observable sector by gauge interactions, with the gauge fields associated with the broken SU(5) generators playing the role of the messengers. The superpartner spectrum presents no anomaly; in particular, all soft scalar masses squared are positive. Timon contributed to all aspects of this work, from the effective potential calculations to the computation of the gauge-mediated contributions to soft supersymmetric masses, and he participated actively in our physics discussions. We are now working on another project about proton decay in supersymmetric GUTs in which his input is crucial, in particular for the numerical part.

From my interactions with Timon I can say that he has a solid knowledge of quantum field theory, supersymmetry and Grand Unified Theories; he is an efficient and reliable calculator, and his input in physics discussions and initiative are significant. I believe he can work autonomously, even though he still needs some guidance in his research. The list of his publications is rather short at this stage, but one should keep in mind that the project he started with (simultaneous gauge and supersymmetry breaking) is a difficult one. It took us some time indeed to identify the right approach to the problem.

In summary, I have no hesitation to recommend Timon Mede for a postdoctoral position at your institute. He is a reliable collaborator and possesses all the skills needed to become a successful researcher in particle theory.

Sincerely,

Stéphane Lavignac