Abstract Submitted
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Stable Bound States of Yb and Pr Negative Ions[1] A.Z. MSEZANE, Z. FELFLI, Clark Atlanta University, D. SOKOLOVSKI, The Queen's University of Belfast, UK — Andersen *et al* [1] concluded, through careful experimental investigation, that the electron affinity (EA) of Yb should be less than 3 meV and the accuracy of the theoretical calculations was deemed insufficient to provide a definitive answer to whether a stable bound state of the negative Yb ion exists. Such a small EA value for Yb is suitable for quenching Rydberg states, going through the formation of a temporary negative ion by ground state atoms with low EA's [2]. Our result obtained using the recent Regge- pole methodology [3] in which a Thomas-Fermi potential incorporates the important core- polarization potential, contradicts the conclusion in [1] by predicting a binding energy of 28 meV for the Yb^- ion with a d-orbital electron attachment, including a Ramsauer-Townsend minimum at 20 meV and an s-wave Wigner threshold behavior of the total elastic cross section. Results for the e^--Pr scattering will also be presented and contrasted with those for e^--Yb scattering.

[1] H. H. Andersen, T. Andersen and U. V. Petersen, J. Phys. B **31**, 2239 (1998)
[2] I. I. Fabrikant and V. S. Lebedev, J. Phys. B **33**, 1521 (2000)
[3] D.Sokolovski *et al*, Phys. Rev. A **76**, 012705 (2007)

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