

Recent Conclusions from Proton-Induced ^3He - and α -Emission into the Continuum

A.A. Cowley^{1,2}, **S.S. Dimitrova**^{3,4}, **E.V. Zemlyanaya**⁴, **K.V. Lukyanov**⁴,
J.J. van Zyl¹

¹Department of Physics, Stellenbosch University, Private Bag X1, Matieland 7602, South Africa

²iThemba Laboratory for Accelerator Based Sciences, P O Box 722, Somerset West 7129, South Africa

³Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences, 1784 Sofia, Bulgaria

⁴Joint Institute for Nuclear Research, 141980 Dubna, Russia

The reaction mechanism of proton-induced composite particle emission, such as ^3He - and α -particles, into the continuum has been a subject of interest for many years. The basic reaction process as a statistical multistep pre-equilibrium formulation has been identified and confirmed long ago. However, many important details were until fairly recently still obscure. Valuable insight into the mechanism of (p, α) and $(p, ^3\text{He})$ reactions only became available with our work during the last 4 years [1-4]. Results and conclusions based on these studies at incident energies from 65 to 160 MeV will be presented and evaluated. Some remaining problems and possible future avenues of investigation will also be discussed.

References

- [1] A.A. Cowley, S.S. Dimitrova, E.V. Zemlyanaya, K.V. Lukyanov, J.J. van Zyl, *Phys. Rev. C* (in press)
- [2] S.S. Dimitrova, A.A. Cowley, E.V. Zemlyanaya, K.V. Lukyanov, *Phys. Rev. C* **90** (2014) 054604.
- [3] S.S. Dimitrova, A.A. Cowley, J.J. van Zyl, E.V. Zemlyanaya, K.V. Lukyanov, *Phys. Rev. C* **89** (2014) 034616.
- [4] A.A. Cowley, J.J. van Zyl, S.S. Dimitrova, E.V. Zemlyanaya, K.V. Lukyanov, *Phys. Rev. C* **85** 054622 (2012).