

TOWARD UNDERSTANDING OF THE NUCLEAR FORCE VIA DETAILED
SPECTROSCOPY OF ^{208}Bi AND DEVELOPMENT OF NEW TECHNIQUES
FOR STUDIES OF NEUTRON RICH EXOTIC NUCLEI: SPECTROSCOPY OF
 ^7He .

Abstract

by

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This thesis is an experimental study of the nuclear force. In the first part of the thesis the single particle structure of ^{208}Bi is studied via the $\gamma - \gamma$ coincidence technique. This experimental data provides information about the residual particle-hole interaction in the Lead region. In the second part of the thesis the structure of ^7He is studied. The experimental study of ^7He was motivated by experimental evidence for reduction of the spin-orbit force in the above nucleus. To study the ^7He structure two new experimental techniques were developed. The new data obtained with these techniques showed that there is no reduction of the spin orbit force in ^7He . It is shown that the developed methods can be used to study other exotic neutron rich nuclei. The techniques are described in details in this work and future perspectives are given.