

Abstract Submitted
for the DNP11 Meeting of
The American Physical Society

α -Clustering in ^{18}O MELINA AVILA, GRIGORY ROGACHEV, ERIC JOHNSON, AMY CRISP, J. GILES, Florida State University, BERT GREEN, KIRBY KEMPER, K. LEE, DONALD ROBSON, BRIAN ROEDER, Florida State University, VLADILEN GOLDBERG, CHANGBO FU, ROBERT TRIBBLE, Cyclotron Institute, Texas A&M University, SIMON BROWN, University of Surrey — The α -cluster structure of $N \neq Z$ nuclei is poorly known and is a subject of intense theoretical discussion. α -clusters have been used to explain various nuclear effects including quasi-rotational bands of states with large α -particle widths, which were observed in light $4N$ nuclei, ^8Be , ^{12}C , ^{16}O and ^{20}Ne . We report on the observation of the α -cluster structure in the $N \neq Z$ nucleus ^{18}O . The α -cluster structure of ^{18}O was studied through $\alpha+^{14}\text{C}$ elastic scattering using the Thick Target Inverse Kinematics (TTIK) technique. The analysis was performed using a multi-level, multi-channel **R**-Matrix approach. It was found that ^{18}O has an elaborate α -cluster structure, including two unusual states with α widths exceeding the formal single particle limit. A comparison of the observed ^{18}O α -cluster structure with the predictions of potential model approach was performed. A more detailed description of the two very broad states can be given using this potential model approach.

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Date submitted: 30 Aug 2011

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