

Abstract Submitted
for the HAW05 Meeting of
The American Physical Society

α -Cluster States in ^{18}O SIMON BROWN, GRIGORY ROGACHEV, BERT GREEN, KIRBY KEMPER, ALEXANDER MOMOTYUK, BRIAN ROEDER, Department of Physics, Florida State University, Tallahassee, FL 32306, VLADILEN GOLDBERG, CHANGBO FU, Cyclotron Institute, Texas A&M University, College Station, TX 77843 — α clustering is a remarkable phenomenon, which plays a very important role in our understanding of nuclear forces. The α -cluster structures of $N=Z$ nuclei ^{12}C , ^{16}O and ^{20}Ne has been extensively studied. It was the observation of α -cluster rotational bands in these nuclei that inspired the development of theoretical models capable of treating clustering phenomena in nuclei. Much less is known, however, about the alpha cluster structure in $N\neq Z$ nuclei. It was recently shown in studies [1,2] that α -cluster states can be observed in ^{22}Ne , with unusual findings such as the doubling of α -cluster rotational bands. The focus of this discussion will be the alpha cluster structure of the ^{18}O nucleus. The α cluster states in ^{18}O were populated via elastic scattering of radioactive beam ^{14}C (from the Florida State Tandem-LINAC facility) on α -particles using the Thick Target Inverse Kinematics technique [3]. Features of $^{14}\text{C}+\alpha$ molecular rotational bands will be considered.

- [1] G.V. Rogachev et al., Phys. Rev. C64, 051302R (2001).
- [2] V.Z. Goldberg et al., Phys. Rev. C69, 024602 (2004).
- [3] K.P. Atremov et al., Sov. J. Nucl. Phys. 52, 408 (1990).

Grigory Rogachev
Department of Physics, Florida State University, Tallahassee, FL 32306

Date submitted: 26 May 2005

Electronic form version 1.4