

Abstract Submitted
for the 4CF12 Meeting of
The American Physical Society

The Intermediate-Mass Black Hole Candidate in the Center of NGC 404 KRISTINA NYLAND, New Mexico Tech, JOSH MARVIL, JOAN M. WROBEL, NRAO, LISA M. YOUNG, New Mexico Tech, B. ASHLEY ZAUDERER, Harvard-Smithsonian Center for Astrophysics — We present the results of deep, high-resolution, 5 GHz Expanded Very Large Array (EVLA) observations of the nearby, dwarf lenticular galaxy and intermediate mass black hole candidate ($M_{\text{BH}} \sim 4.5 \times 10^5 M_{\odot}$), NGC 404. We found a modestly resolved source in the NGC 404 nucleus with a total radio luminosity of $7.6 \pm 0.7 \times 10^{17} \text{ W Hz}^{-1}$ at 5 GHz and a spectral index from 5 to 7.45 GHz of $\alpha = -0.88 \pm 0.30$. NGC 404 is only the third central intermediate mass black hole candidate detected in the radio regime with subarcsecond resolution. The position of the radio source is consistent with the optical center of the galaxy and the location of a known, hard X-ray point source ($L_{\text{X}} \sim 1.2 \times 10^{37} \text{ erg s}^{-1}$). The faint radio and X-ray emission could conceivably be produced by an X-ray binary, star formation, a supernova remnant or a low-luminosity AGN powered by an intermediate mass black hole. In light of our new EVLA observations, we find that the most likely scenario is an accreting intermediate mass black hole, with other explanations incompatible with the observed X-ray and/or radio luminosities or statistically unlikely.

Kristina Nyland
New Mexico Tech

Date submitted: 21 Sep 2012

Electronic form version 1.4