Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Precision Measurement of the ^{7}Be Solar Neutrino Flux and its Annual Modulation SZYMON MANECKI, Virginia Polytechnic Institute & State University, BOREXINO COLLABORATION — In May 2007, the Borexino experiment opened a new chapter in the low energy solar neutrino world. Its calorimetric detector, of remarkably low levels of radioactive background, relies on the fundamental principle of elastic electron-scattering of all neutrino flavors. In the quest for the Holy Grail of solar physics, the ^{7}Be line, we have achieved extraordinary precision below 5%, made possible predominantly due to extensive calibration campaigns. With this sensitivity, we are able to reach levels where effects of the 7% annual modulation of the signal become detectable. Thus, solving the solar puzzle extends beyond the Sun, it brings new tools in the search for ν oscillations in the vacuum region. With sufficient statistics, we will be able to establish or exclude almost all values of ($\sin^2\theta$,Δm^2) preferred by other experiments. At this point, it is the stability control of the detector's backgrounds that plays a critical role, therefore understanding known fluctuations can drastically improve its sensitivity. The detector's performance and calibrations will be presented in the first part of this discussion, while the rest will focus on the ^{7}Be flux measurements and signal variations with an emphasis on the stability of the backgrounds.

Szymon Manecki
Virginia Polytechnic Institute & State University

Date submitted: 10 Jan 2012 Electronic form version 1.4