



Dipartimento di Fisica  
Università di Cagliari  
INFN, Sezione di Cagliari



# HIGH ENERGY PHYSICS COLLOQUIA

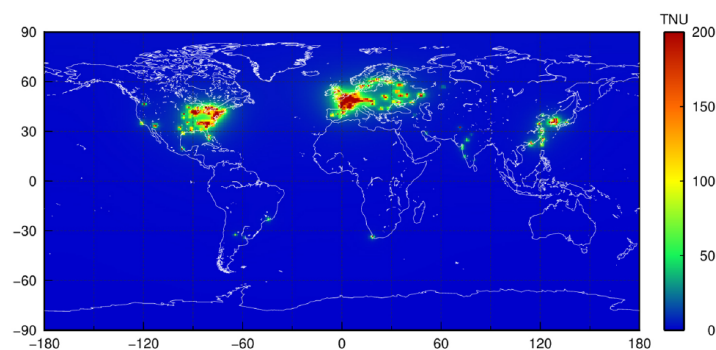
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Marica Baldoncini  
*Università di Ferrara*

## A WORLDWIDE REFERENCE MODEL FOR ANTINEUTRINOS FROM REACTORS

### Abstract

The detection of electron antineutrinos in liquid scintillation detectors is playing a crucial role in exploring neutrino physics and astrophysics, in unveiling the interior of the Earth (i.e. geoneutrinos) and the operation of nuclear reactors. The main background in geoneutrino measurements is due to the electron antineutrinos produced by nuclear power plants, which are the strongest man-made antineutrino sources. A worldwide model for antineutrinos from reactors based on official reactors operational data yearly published by the International Atomic Energy Agency (IAEA) will be discussed. A comprehensive database of commercial nuclear power plants in the world covering a time lapse of 12 years (2003–2015) will be presented, which can be freely downloaded from the web page [www.fe.infn.it/antineutrino](http://www.fe.infn.it/antineutrino). This dataset is a ready-to-use input that everybody can adopt for estimating both the reactor signal and spectra for every location in the world. According to this dataset, the expected signal together with its uncertainty from commercial reactors for ongoing (KamLAND and Borexino), under construction (SNO+ and JUNO) and proposed (RENO-50, LENA, and Hanohano) experimental sites has been computed. A multitemporal analysis (2003–2013) of the KamLAND and Borexino reactor signals will be shown, which makes signal temporal structures emerge.



### Contatti:

M. Lissia ([marcello.lissia@ca.infn.it](mailto:marcello.lissia@ca.infn.it))

Mailing list: <https://lists.ca.infn.it/sympa/info/hep-colloquia>

