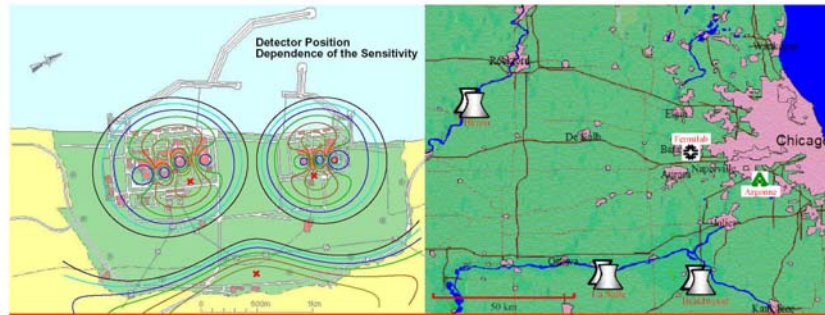


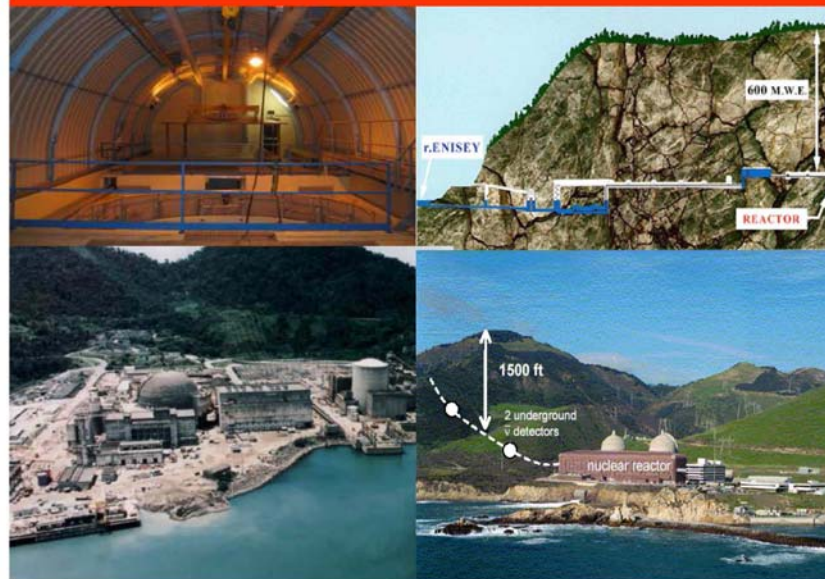
Interna

oup

- ▶ Alabama
- ▶ Argonne
- ▶ Cal Tech
- ▶ Berkeley
- ▶ Chicago
- ▶ Columbia
- ▶ Fermilab
- ▶ IIT
- ▶ Kansas State



A New Nuclear Reactor Experiment to Measure θ_{13}
January 2004
International Reactor θ_{13} Working Group



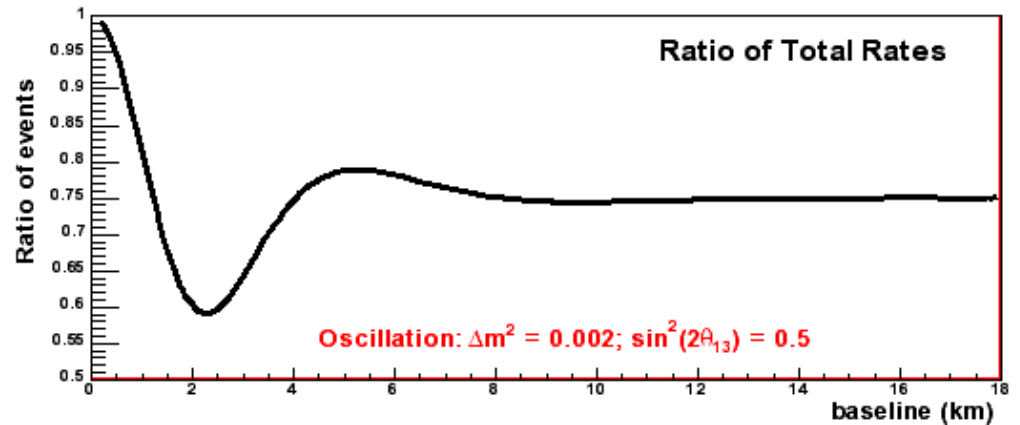
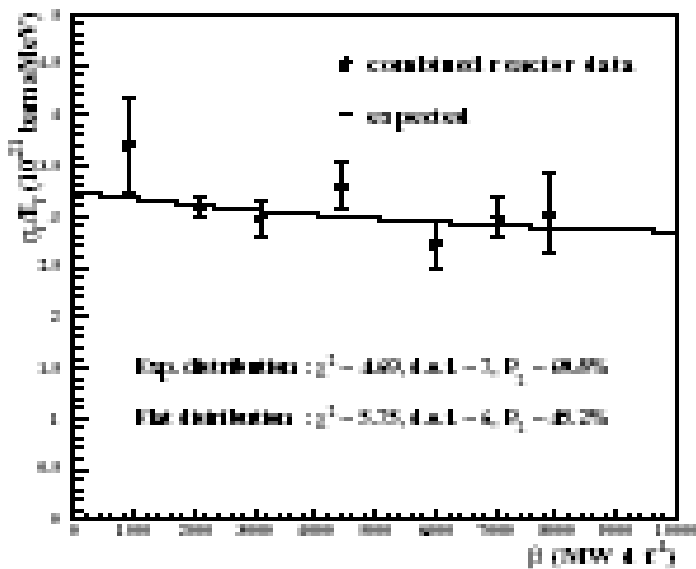
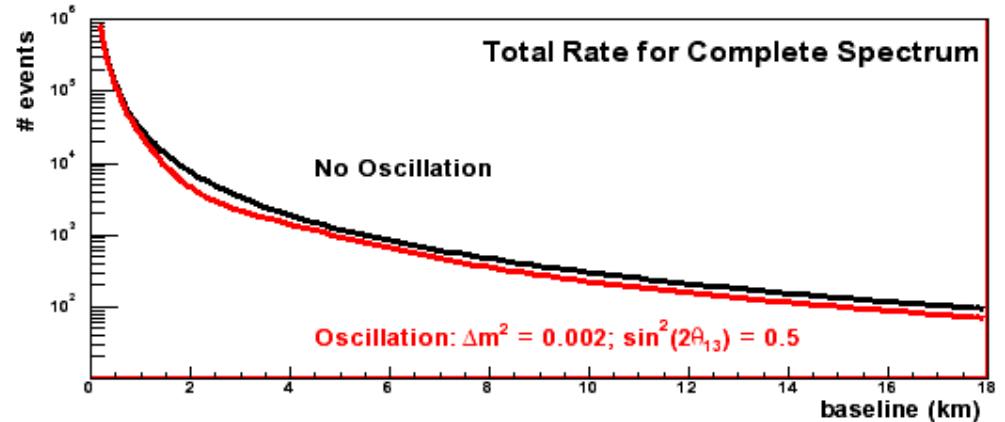
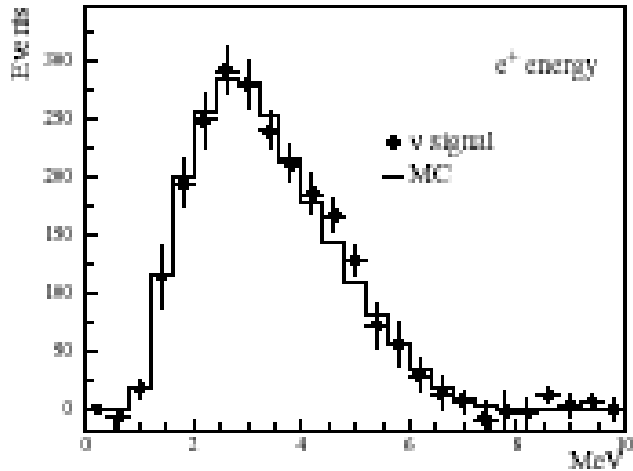
- ▶ Munich TUM
- ▶ MPI-Heidelberg
- ▶ MPI-Munich
- ▶ SISSA
- ▶ College de France
- ▶ CEA/Saclay
- ▶ INFN Bologna
- ▶ INFN Trieste

- ▶ Brasileiro
- ▶ Campinas
- ▶ CBPF-Rio

Status from Angra dos Reis, Brazil

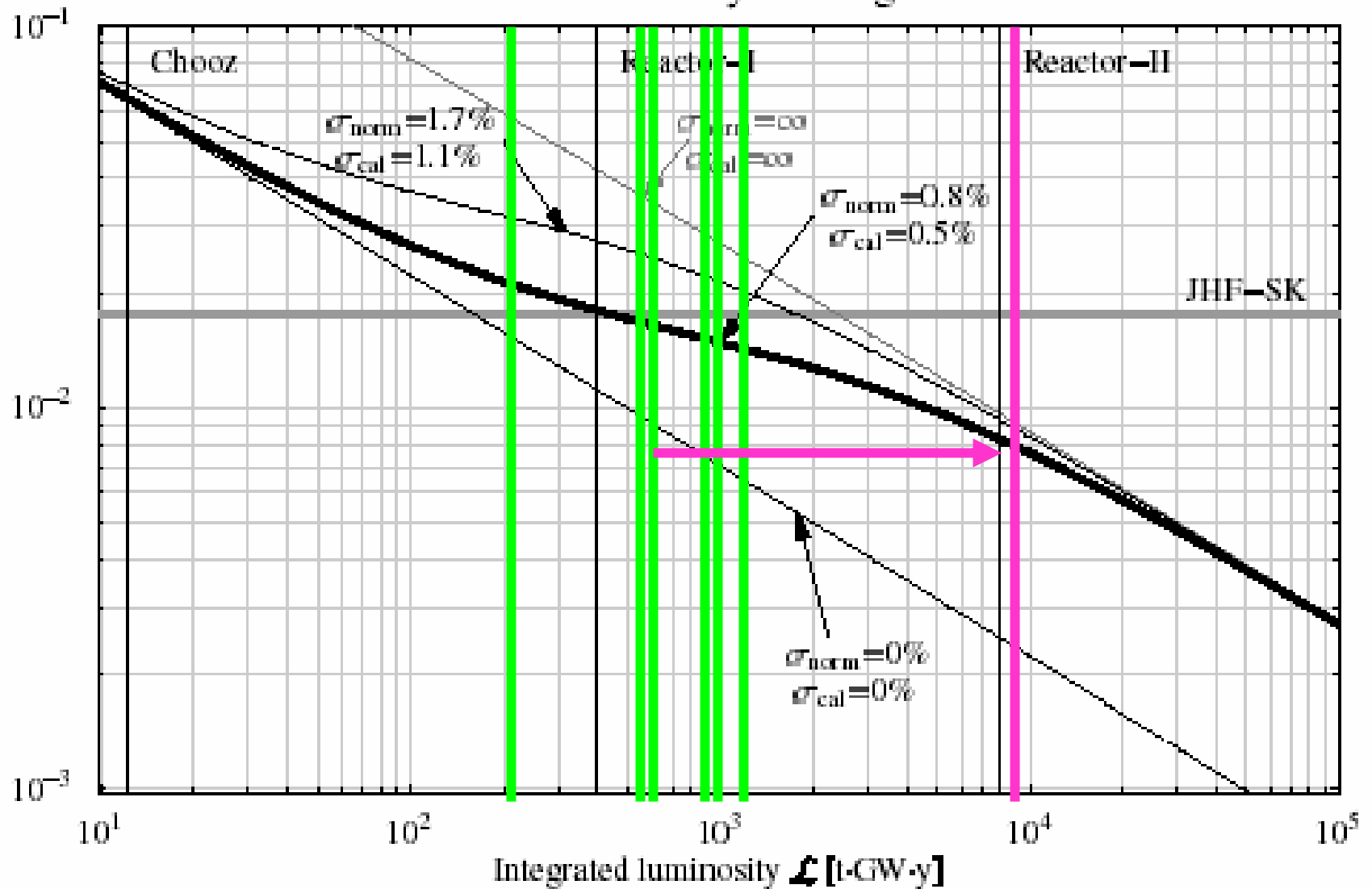
David Reyna
Argonne National Lab

Systematics of Reactor Flux



Experimental Luminosity

Luminosity Scaling



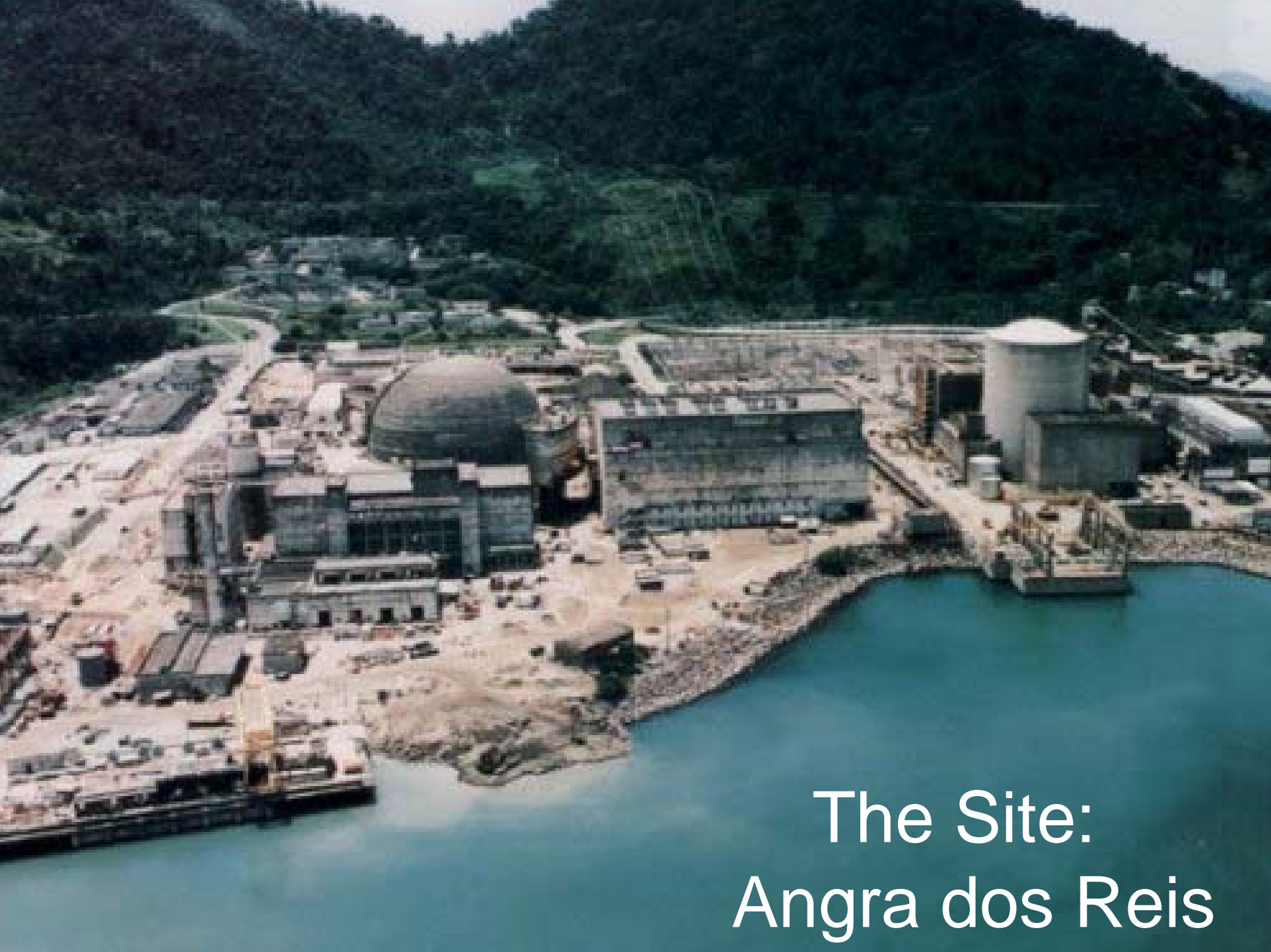
Spectral Measurement is Hard

- Near/Far detectors may be different
 - OK for shape analysis since each bin is N_i/N_{tot}
- Backgrounds Matter
 - Energy dependence
 - Difference Near vs. Far
- Rate at Near
 - Deadtime?
- Calibration over full energy range?
- Bin-to-bin correlated errors?

But we are beginning to address these issues

Guiding Principles of Angra Design

- Attempt to Control Backgrounds
 - Significant overburden (>1700mwe at far site)
 - Single reactor allows off-time
- Utilize low civil construction costs
 - Horizontal tunnel
 - Lower labor costs
- Favorable reactor company
 - Good connections to physics community



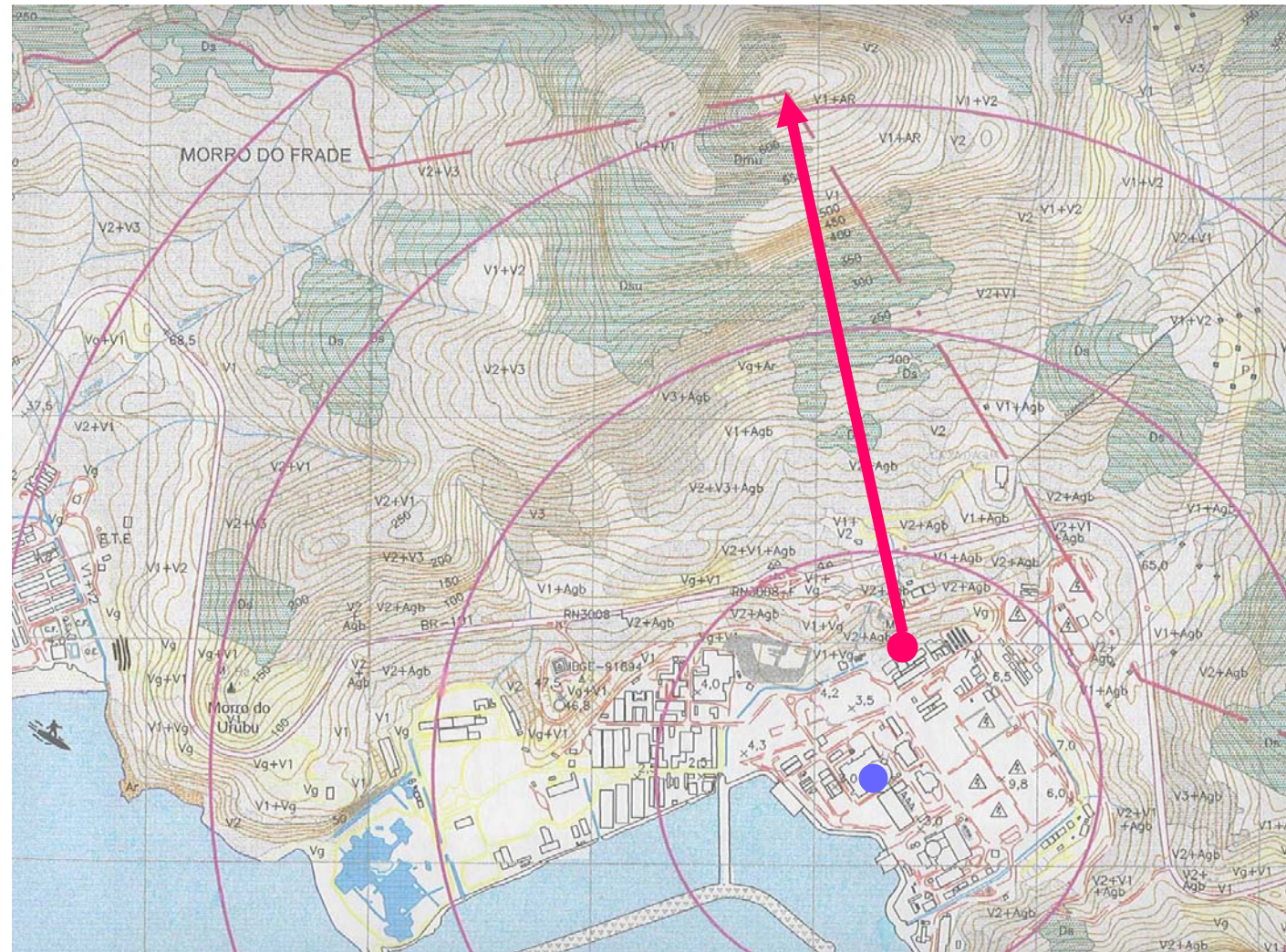
The Site:
Angra dos Reis

Current Design at Angra

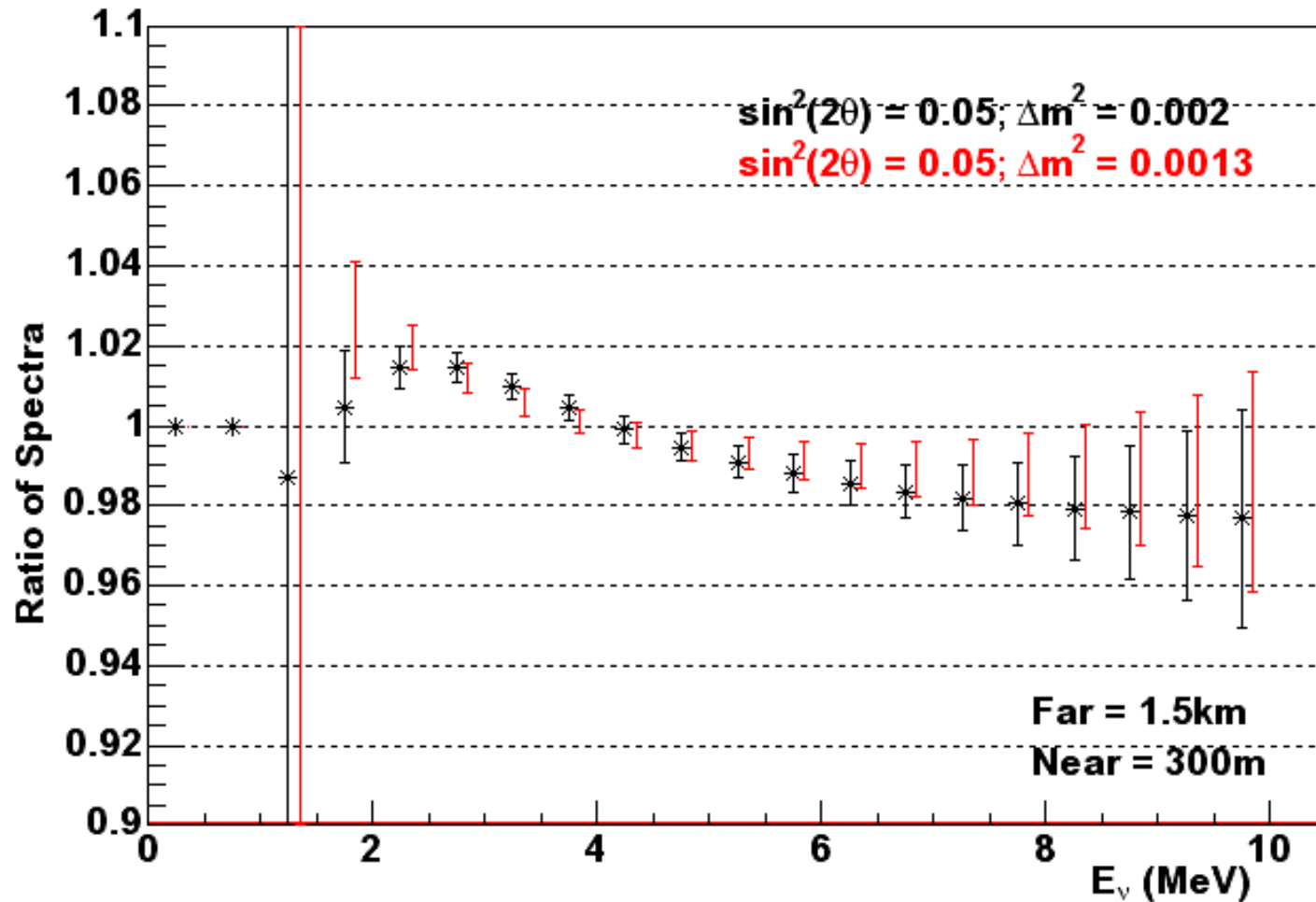
Overburden
Far ~1700 mwe
Near ~200 mwe

Baseline
Far ~1.5 km
Near < 300m

Target Mass
Far ~ 500 ton
Near ~ 50 ton

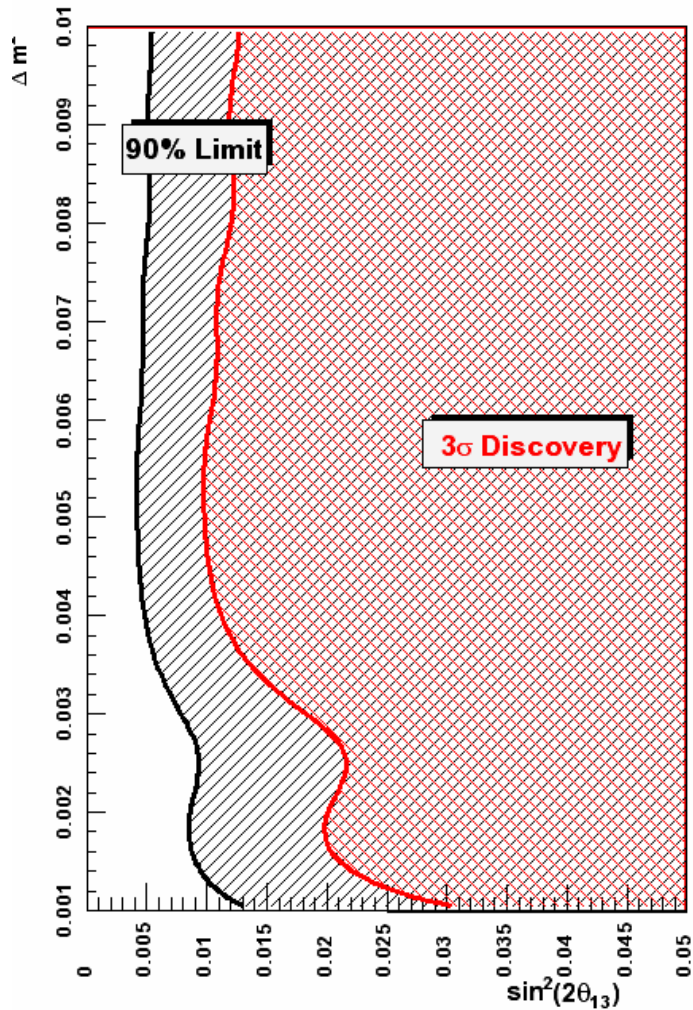


Possible Spectrum Ratio

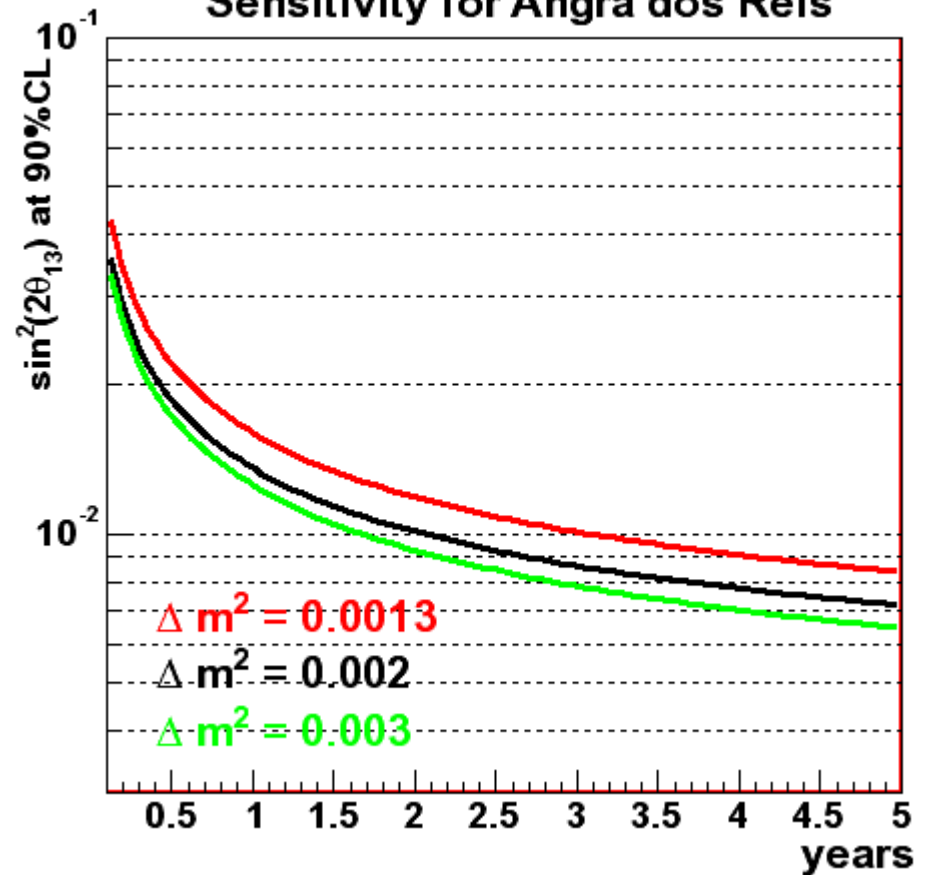


Expected Sensitivity at Angra

Sensitivity for Angra dos Reis



Sensitivity for Angra dos Reis



Schedule/Funding

- Current funding for Site development
 - Outside funding already provided for cost estimates
 - Just received a grant of \$100K for site development and design work
 - In process of getting UNESCO funding
- Complete designs and submit LOI to Brazilian government by end of summer
- Produce a complete proposal by middle of 2005
- Will host the next International Working Group Meeting at end of Feb. 2005

