Introduction on TITUS

**T**okai **I**ntermediate **T**ank for **U**noscillated **S**pectrum

- Gd-doped WC 2kton detector with partial MRD coverage at ~2km from target
- Main aims:
  - Decrease error on CP violation
  - Perform other physics (eg cross sections)
- Main characteristics
  - Use Gd neutron capture for beam event selection (extension from traditional SN usage)
  - Magnetized WC detector
  - Separation neutrino/antineutrinos using both Gd and MRD
  - Work on a few fronts:
    - Detector optimization (for both tank and MRD)
    - Physics potential
    - Software

Design by M. Rayner
(mainly MRD changes)

7 m   2 m

1 m

11 m

22 m
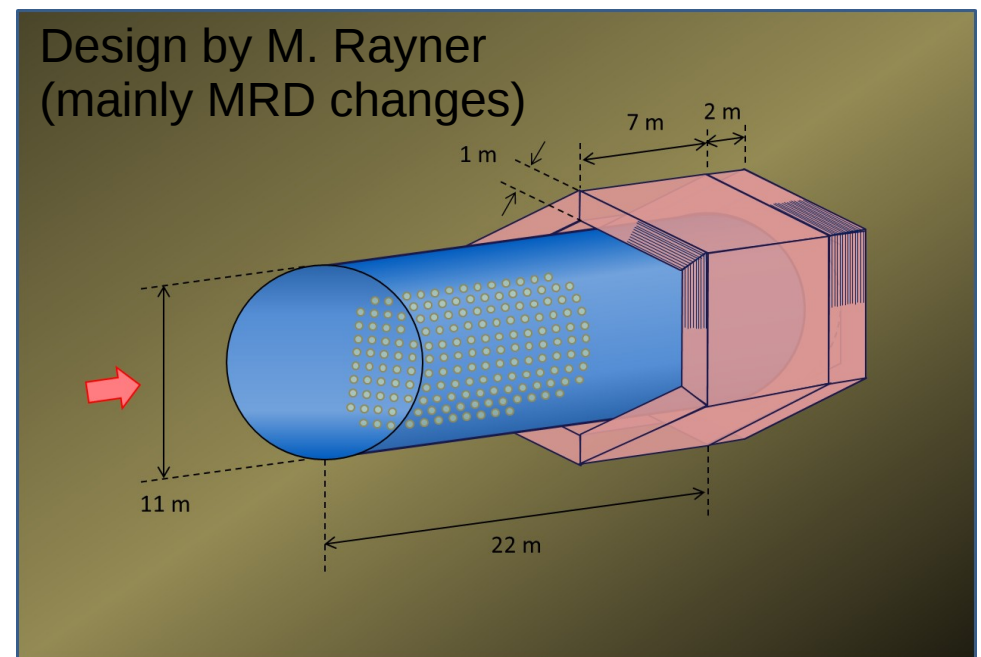
Intro (cont'd)

- Current software based on WChSandBox ("fast simulation" - synergie with ANNIE). It has Gd implemented.
- Underway:
  - Integration of Gd capture in WCSim
  - LAPPDs simulation in WCSim
  - Several institutions contributing to the design studies. UK got funds from TITUS to work on the design of this detector.

- New analyses started and reported in this session:
  - Sensitivity for CP
  - Sand muons
  - Cross section
  - Steriles
  - SN
- Several MRD detector configurations are being analysed. Next step, integration with the tank.

Talks on TITUS

Parallel session
- Analysis studies– Dave Hadley
- CP sensitivity – Sam Short
- MRD studies – Mark Rayner

Plenary session
- Introduction to the intermediate detector and Physics – Matthew Malek
- A magnetized muon range detector for TITUS – Mark Rayner