Introduction to
GRAND White Paper workshop
parallel sessions

IAP, May 17-19, 2017

General remarks

- We want an interactive & productive workshop aiming at white paper production within the end of 2017

  ➔ **flexible format for this parallel session:**

  – We can ajust timeline «on the fly» (parallel/plenary sessions, duration)

  – We can ajust session topics

  – We can ajust session format: ppt presentations, free discussions, etc… Feel free to do as you like.

  – We can break parallel session into sub-sessions (smaller groups with «hands-on» work)

Proposed topics & timeslots

- **Wednesday PM**
  - Science Case: I.A Cosmogenic neutrinos (Kumiko)
  - SC: I.E Ultra-high-energy gamma rays (Foteini)
  - Simulation & Design: neutrino sensitivity computation & EAS reconstruction
- **Thursday AM**
  - SC: I.F Cosmology: (XiangPing)
  - SC: I.G FRBs (Cyril)
  - SC: I.H Giant radio pulses (Fabrice)
  - S&D: neutrino sensitivity computation & EAS reconstruction
- **Thursday 1:30pm**
  - SC: I.B eV neutrino astronomy (Ke)
  - SC: I.D Ultra-high-energy cosmic rays (Charles)
  - S&D: EoR & FRBs with GRAND: experimental aspects
- **Thursday 4pm**
  - SC: I.B eV neutrino astronomy (Ke)
  - SC: I.C Fundamental neutrino physics (Mauricio)
  - S&D: Stages towards GRAND (GRANDproto300 & GRAND10k): experimental aspects
- **Friday AM**
  - SC: any section needed to be finished
  - S&D: Stages towards GRAND (GRANDproto300 & GRAND10k): experimental aspects
  - Both: summaries of parallel sessions by each section coordinator/sub-working-group
- **Friday PM**
  - Plenary: summary of each parallel session

Science case session schedule

➜ Wednesday PM:

start with 2-3 slides by each section coordinator

people sign-up for sections

split in 2 sub-groups to work on 2 different topics

➜ Thursday AM:

2-3 slides by Xiang-Ping+Cyril+Fabrice for EoR/FRB/Giant Pulses

split in 2-3 sub-groups to work on 2 different topics

Science case: questions to address

– Science questions

+ Why is this topic important?
+ What is currently the biggest challenge in this field? Why?
+ What do we need to solve it?
+ Why would GRAND help solve it?

– Practical questions

+ what remains to be done for this section (writing + calculations)
+ what numbers/information do we need from other sections/working groups to converge/make progress?
+ what can be done during these three days and what timeline can we envisage?

Simulation & Design: GRAND neutrino sensitivity & UHECRs

- Some items to be discussed (random order):
  - Simulation strategy & timeline / simulation area for GRAND
  - Detailed presentation of GRAND radio simulation strategy [Anne]
    - What accuracy can we tolerate on this modelisation?
    - Presentation of the toy model validation [Clementina]
  - Input of Harm Shoorlemer
  - Simulation of antenna response & noise (Galactic emission? Ground sources?)
  - Bandwidth(s) for GRAND antennas: LF (~30-100MHz) + HF (~200-300MHz)?
  - Reconstruction of direction, Xmax, energy: strategy & expected performances
  - Rejection of cosmic (UHECRs) & Earth (human sources, thunder) backgrounds
  - Ground reflection effects
    - Radio signal attenuation?
    - Effect on polarisation?
    - Effect on timing?
  - UHECRs & gamma rays simulations: strategy & timeline
  - Summary of tasks & timeline for the white paper

Simulation & Design: EoR & FRBs

- Some items to be discussed (random order):
  - Characteristics of the expected signals
  - Frequency bandwidth of interest
  - Antenna design
  - Signal search strategy with GRAND
  - Associated data format, collection & analysis
  - Tentative schedule towards deployment (?)
  - Summary of tasks & timeline for the white paper

Simulation & Design: Stages towards GRAND

- Some items to be discussed (random order):
  - General strategy: GRANDproto300 (2019)→ GRAND10k(2025) → GRAND200k (203x)?
  - GRANDproto35 (?)
  - GRANDproto300:
    - Antenna(s) design [Didier]
    - Trigger & DAQ system
    - Power supply & data transfer
    - Funding & timeline
  - GRAND10k
    - R&D axes: trigger, DAQ, data transfer
  - White paper: content, tasks and timeline