Science Case Working Group Summary

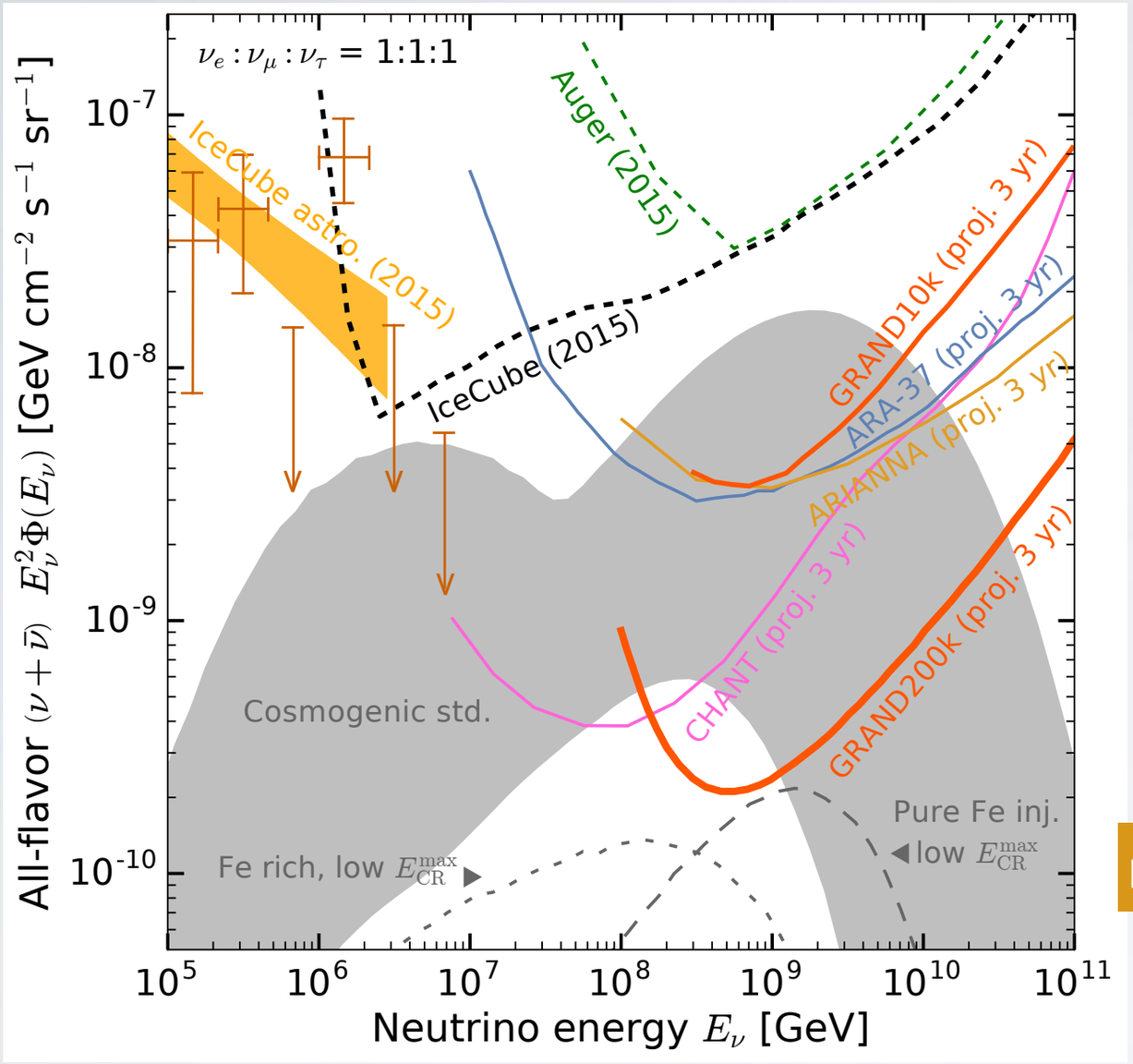
Plots

ready
almost done
to do

- I.A Cosmogenic Neutrinos
  - sensitivity
- I.B EeV Neutrino Astronomy
  - fluxes from sources
  - detecting point sources (angular res-Nev)
  - skymaps with sensitivity + observable sources
- I. C Fundamental Neutrino Physics
  - angular distribution
- I.D UHECR
  - skymaps with sensitivity + observable sources
  - spectrum
  - composition
- I.E UHE gamma-rays
  - point-source sensitivity
- I.F Cosmology
- I.G FRB
  - simulation of FRB signal in GRAND
- I.H Giant Radio Pulses
  - simulation of GRP signal in GRANDproto300

Section I. A Cosmogenic Neutrinos in GRAND

Kumiko, Mauricio, Rafael

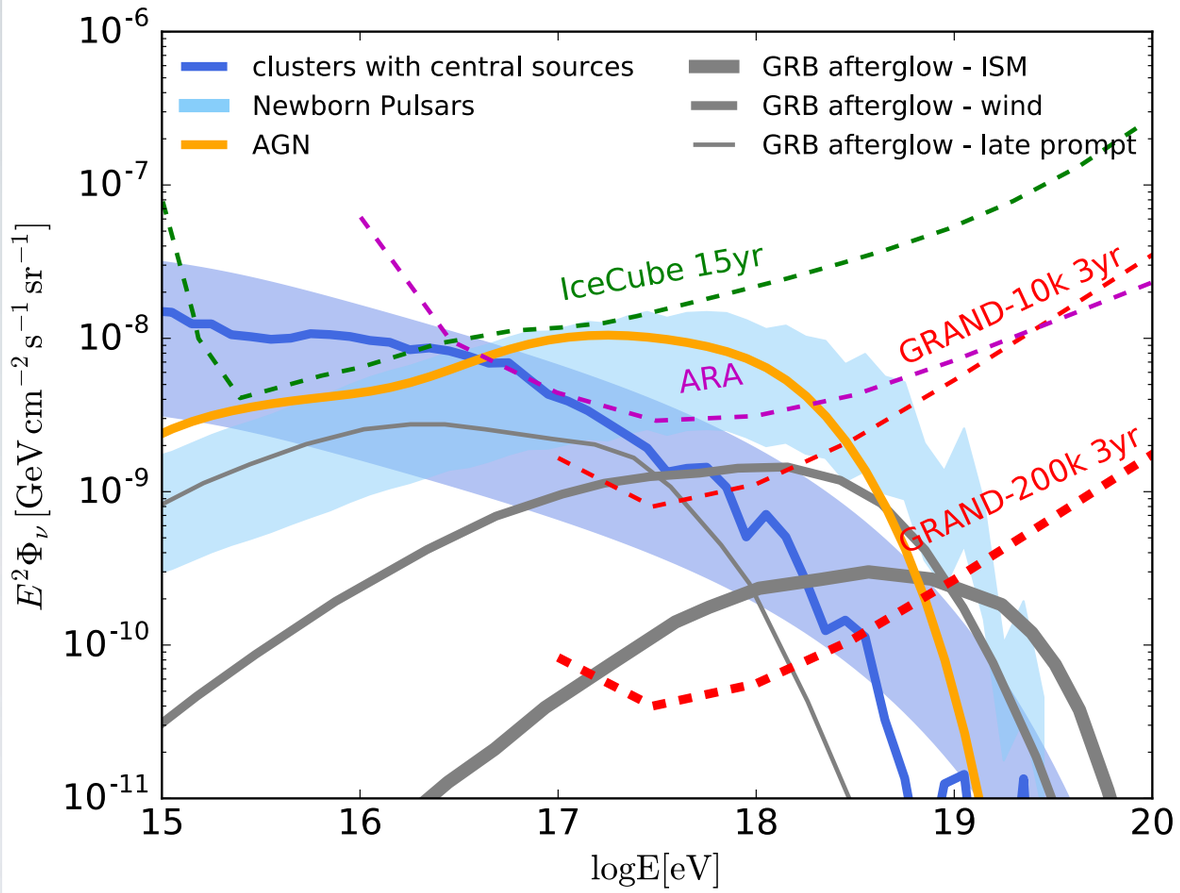


- Refine Auger-compatible band
- calculate and add integrated sensitivity

need energy resolution + differential sensitivity

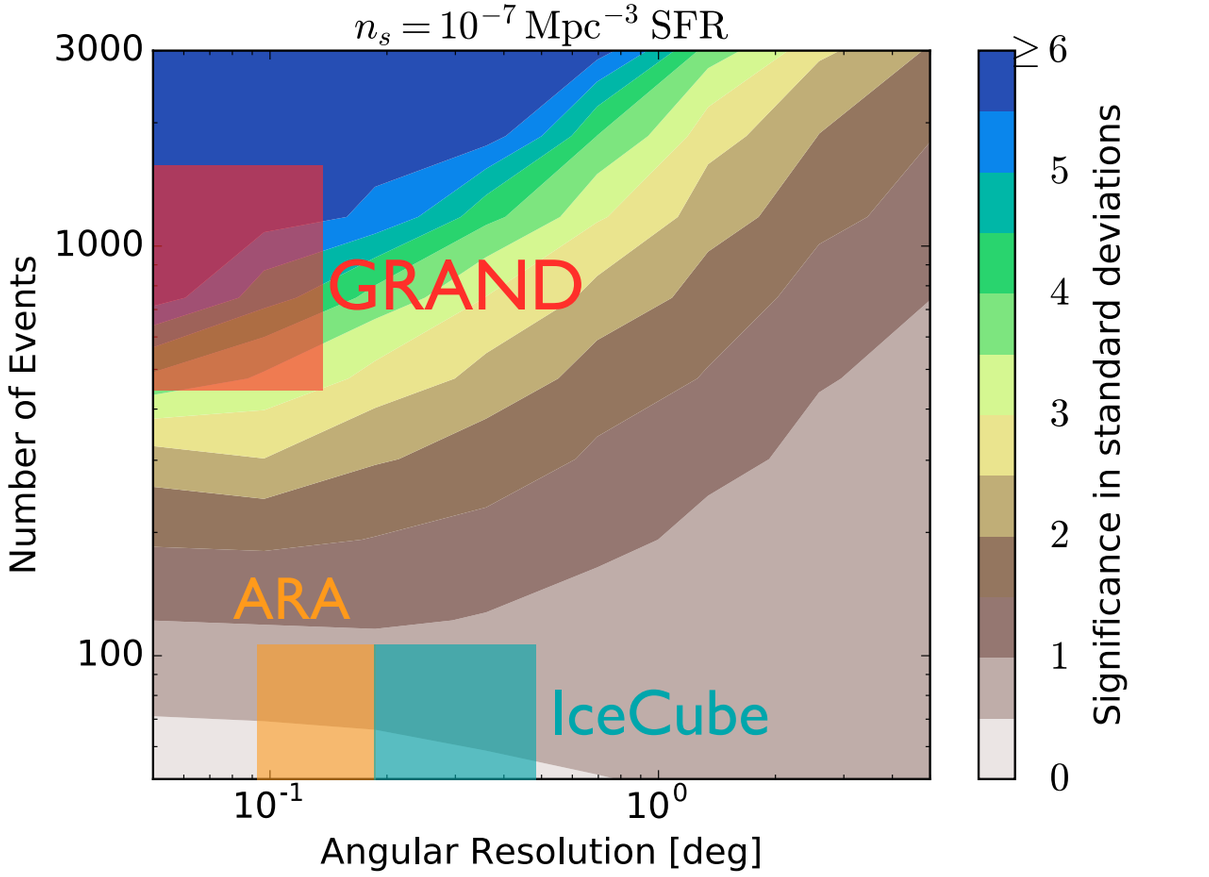
- corresponding number of events
- add steps 10k/200k in text

Constraining Source Models



- Double check sensitivity calculation w. bad energy resolution
- Integral limit or differential limit?

Constraining Source Models



- Estimate event number (range) to be detected by experiments
- Include KM3NeT, IceCube-Gen2
- Explain shape of the contours

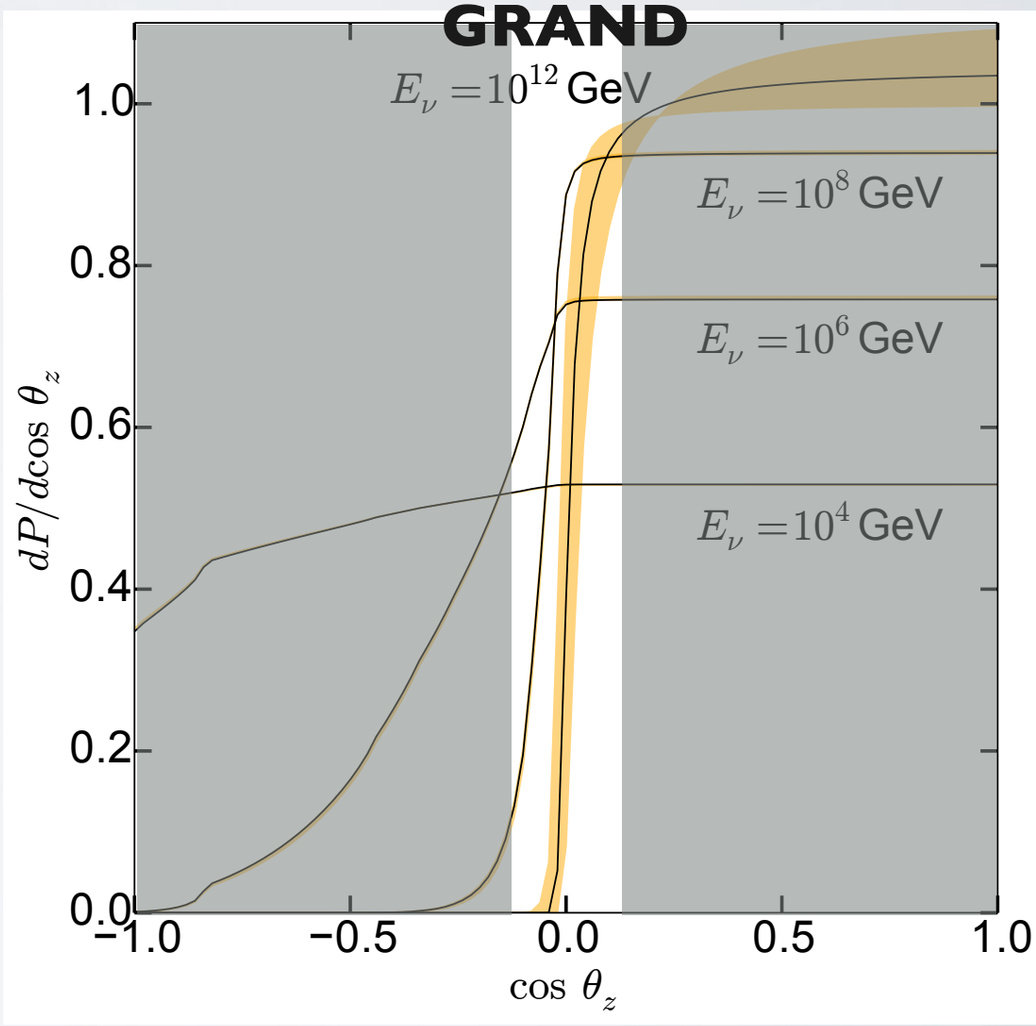
Transient Sources

- Estimate number of transient sources that could occur in each instant sky coverage

New Physics using 3 observables

- spectral shape
- angular distribution
- flavor (if combined with other experiments)
  - change text to reduce flavor section

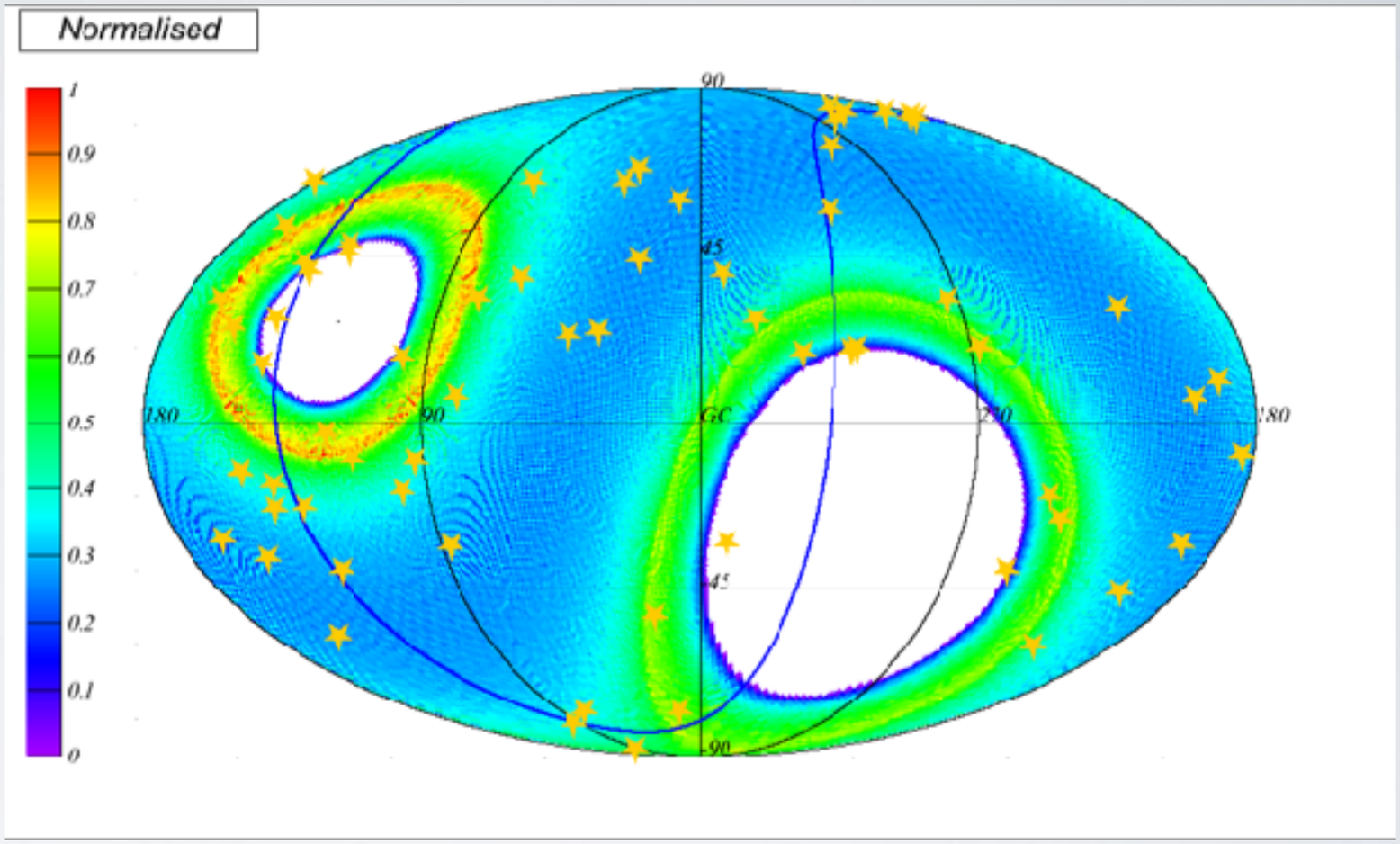
add more lines for high energies



probability distribution of angular directions of event showers

Section I.D UHECRs

Charles, Foteini, Sijbrand, Anne



skymap of sensitivity + observable sources

+ spectrum plot

+ composition

- text to be written
- 2 plots to be made + 1 refined

needed:

- ΔX_{max}
- Energy range
- Energy resolution
- Angular resolution
- Zenith range / efficiency as function of θ

Section I.E UHE Gamma-rays

Foteini, Sijbrand, Charles

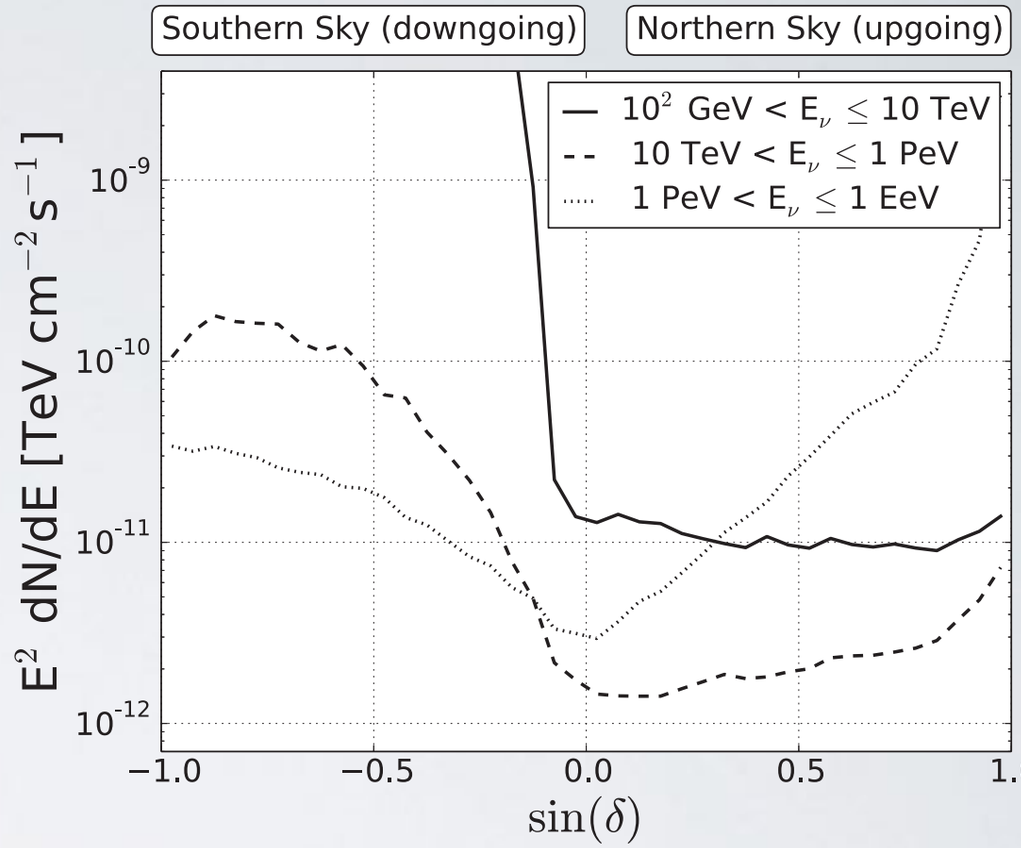


Figure 9. Sensitivity for muon neutrino flux for an E^{-2} spectrum for a 90% C.L. as a function of declination combining the 3 yr of data averaged over right ascension. The three different lines indicate three different energy ranges.

point-source sensitivity as a function of declination

to be made for GRAND

- text to be written
- 1 plot to be made

needed:

- ΔX_{max}
- Energy range
- Energy resolution
- Angular resolution
- Zenith range / efficiency as function of θ

XiangPing, Junhua

- Go only for Global Signatures (total power)

  - text to be written

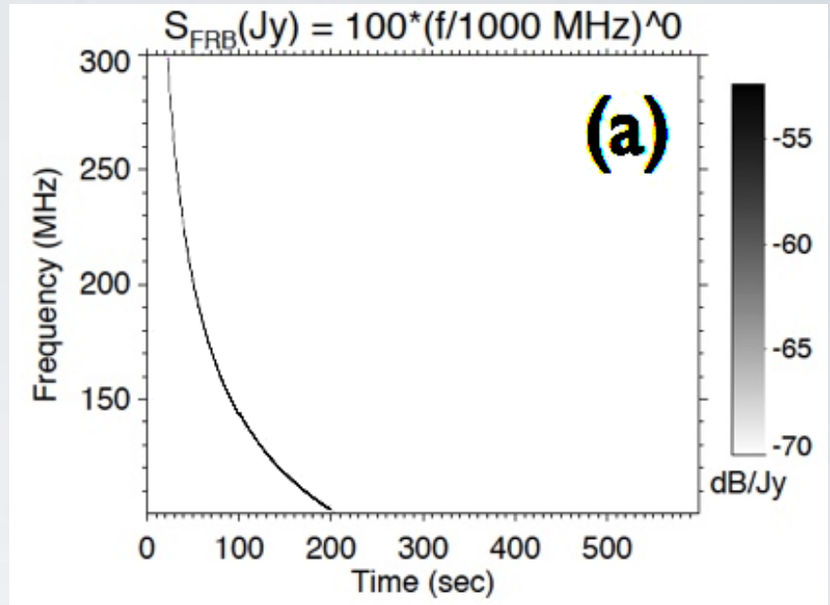
need sensitivity for integrated power of EoR

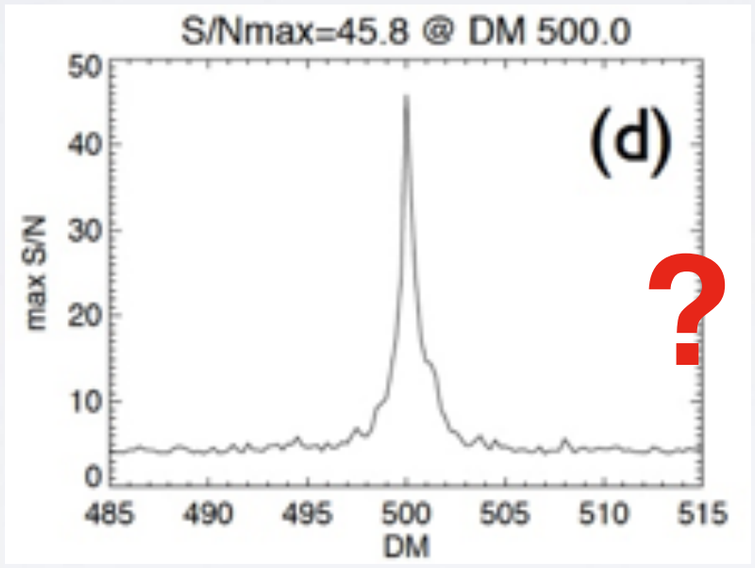
give a table of integrated power of EoR for various models

Sections I.G, I.H FRBs, Giant Radio Pulses

Cyril, Fabrice, Philippe

- **Update simulations for new frequency band + simulations for GRP**





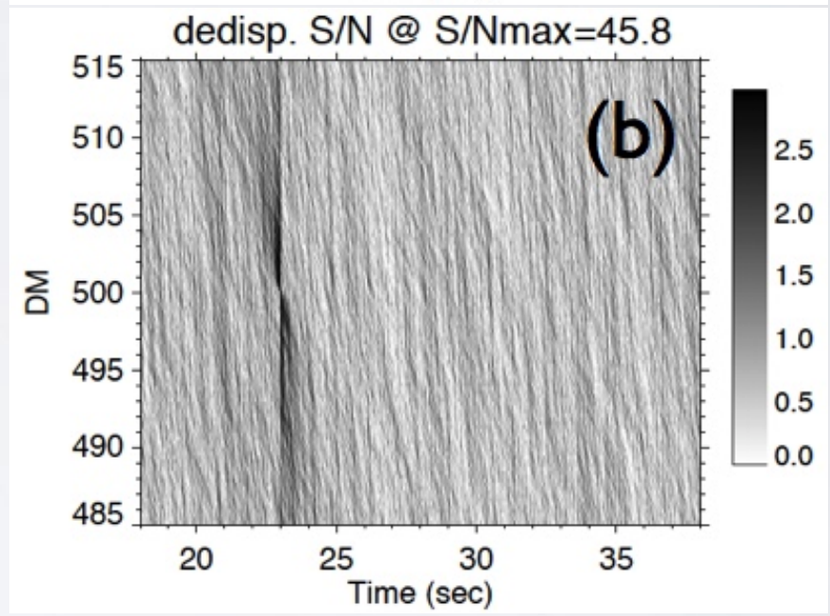


FIG. 7 The top panel (a) shows a (i) dispersed (DM = 500 pc.cm^{-3}) and (ii) diffused 100 Jy and 5 ms long FRB pulse (the simulated galactic noise is not shown since its power largely dominates the signal). The bottom panel (b) shows the result of a blind search. GRAND would detect that event with an SNR of $\sim$ 50. The FRB dispersive drift lasts for $\sim$ 185 s (against $\sim$ 370 s for DM = 1000 pc.cm^{-3})

- **make same plot for GRP for GRANDproto300**