Joint subthreshold analysis

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- People involved: Marion Pillas, Iara Tosta e Melo , Mathieu Lamoureux, Thierry Pradier (other people are welcomed!)

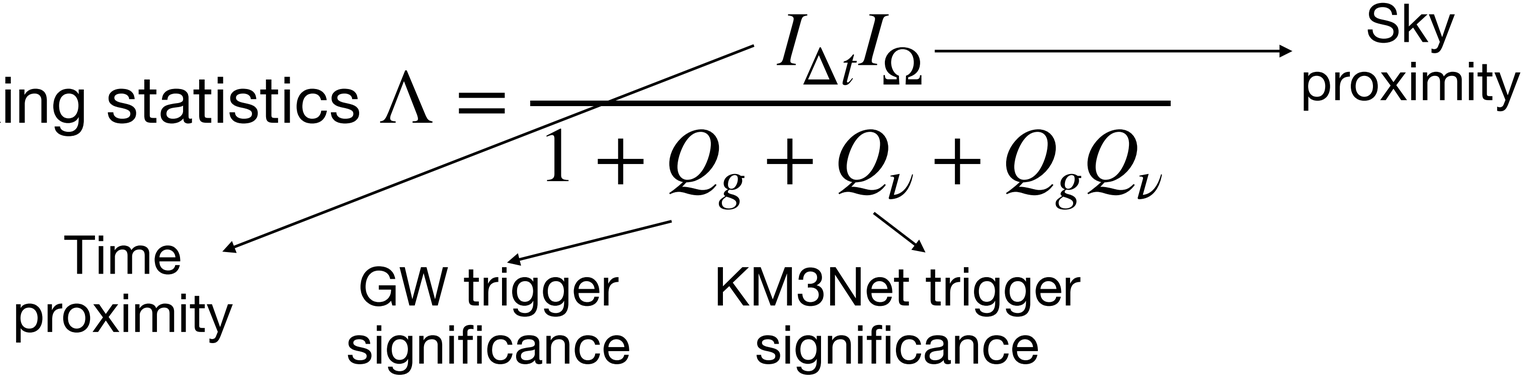
Presentation

- Offline joint symmetric search between LHV and KM3Net triggers
- Compare signal-signal$_{\text{common source}}$ hypothesis vs noise-noise, signal-noise, noise-signal, signal-signal$_{\text{unrelated source}}$ hypotheses

  - Input :
    - HEN: ORCA6 data
    - GW: modeled search —> CBC pipeline (PyCBC, GstLAL, MBTA)
      - Triggers with a FAR < 2/day

Presentation

- Bayesian ranking statistics $\Lambda = \dfrac{I_{\Delta t} I_{\Omega}}{1 + Q_g + Q_\nu + Q_g Q_\nu}$



- Time window: either a large time window (+/-500 s) or a narrower
- Foreground/Background comparison (background generated with time and sky shifts)

Expected results

- Catalog of association candidates & computation of a false alarm rate for each of them
  - If joint detection: characterization
- Efficiency of the search regarding the energy, distance from GW skymap
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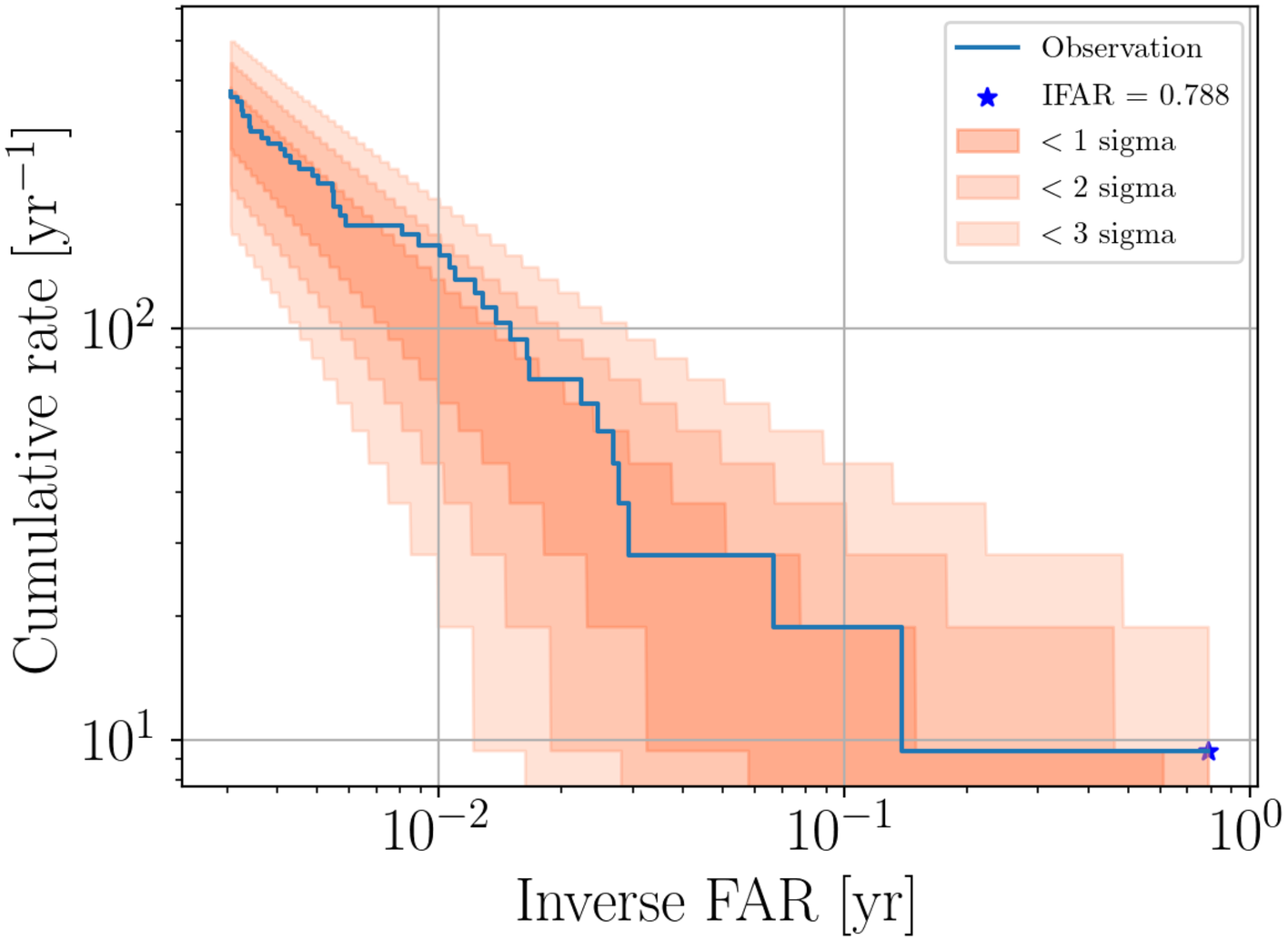

Status

- Bayesian ranking statistics: implemented
- KM3Net skymaps: generated
- Background computation: time shift implemented, sky shift to be done
- False Alarm Rate computation: implemented
- Test of the analysis: computationally working
- Test on simulated signals: simulated neutrinos ready, simulated GW signals to be done