Oscillation working group
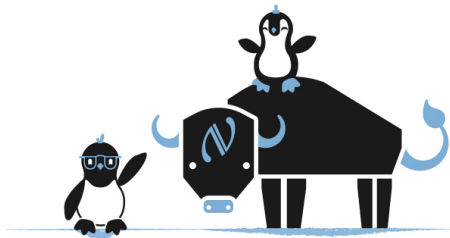
IceDUNE
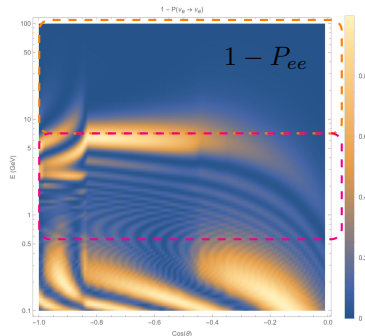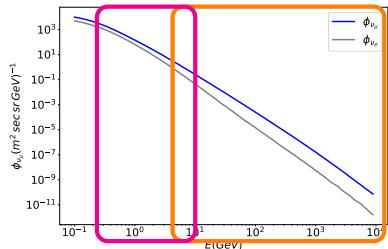
Sinergies between IceCube and DeepCore

Both IceCube and DUNE will measure atmospheric neutrinos:

- ▶ DUNE will be able to constraint the sub-GeV region the flux
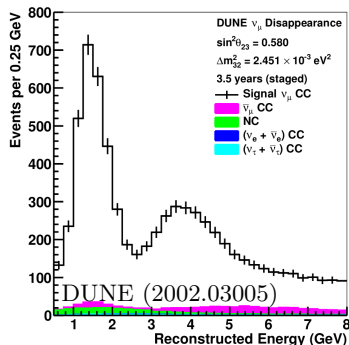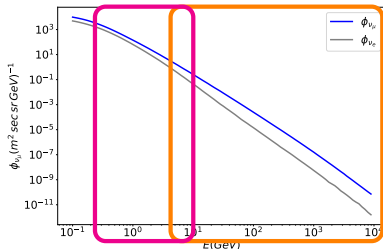
- ▶ IceCube measures the multi-GeV region.

Gustavo F.S. Alves

Sinergies between IceCube and DeepCore

Both IceCube and DUNE will measure atmospheric neutrinos:

- ► DUNE will be able to constraint the sub-GeV region the flux

- ► IceCube measures the multi-GeV region.

- ► DUNE will measure neutrinos from the beam

DUNE (2002.03005)

Sinergies between IceCube and DeepCore

Both experiments will measure the neutrino evolution at different energies scales

In the 3ν mixing scenario:

- ▶ Is there any complementarity in their measurement?
- ▶ θ_{23}, $|\Delta m^2_{31}|$
- ▶ Neutrino event reconstruction

Sinergies between IceCube and DeepCore

Both experiments will measure the neutrino evolution at different energies scales

In the 3ν mixing scenario:

- ▶ Is there any complementarity in their measurement?
- ▶ θ_{23}, $|\Delta m_{31}^2|$
- ▶ Neutrino event reconstruction

Beyond the 3ν mixing scenario:

- ▶ The measurement across several energy scales can help in the constraint of some BSM scenarios?
- ▶ NSI
- ▶ Neutrino Decay
- ▶ ...

Working group:
Yuber Perez-Gonzalez, Gustavo Alves, Jessie Micallef, Ivan Martinez-Soler

Sinergies between IceCube and DeepCore
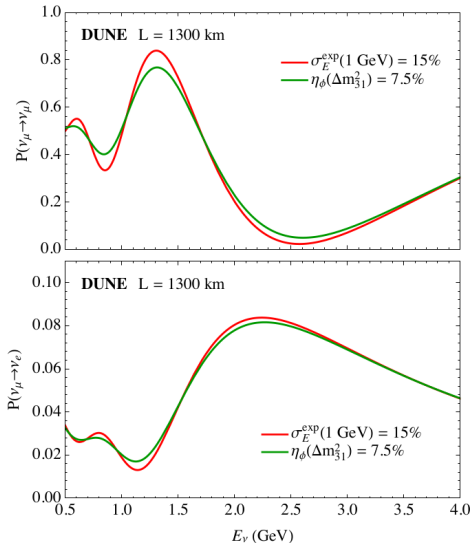
NSI with time variying scalar

- ▶ Temporal variation of the scalar may induce a temporal variation of the neutrino mass and mixings.
- ▶ Different rate of events can contribute to disentangling this effect.

G. Krnjaic, P.A.N. Machado and L. Necib (1705.06740)
R. Fardon, A.E. Nelson and N. Weiner (astro-ph/0309800)

Working group:
Yuber F. Perez-Gonzalez, Ivan Martinez-Soler

Low energy atmospheric neutrinos in DUNE

DUNE can measure sub-GeV neutrinos

- ▶ How down in energy can we go with the atmospheric neutrino in DUNE?
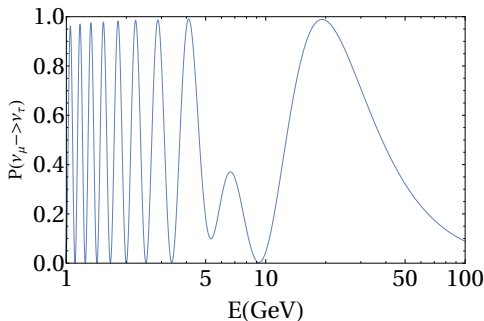- ▶ What can we learn from that measurement?

O.L.G. Peres and A. Yu Smirnov, arXiv:0903.5323

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Gustavo Alves, Yuber F. Perez

Tau apperance

- Both DUNE and IceCube will be accessible to atmospheric ν_τ
- DUNE can also use the beam (high-energy beam mode)
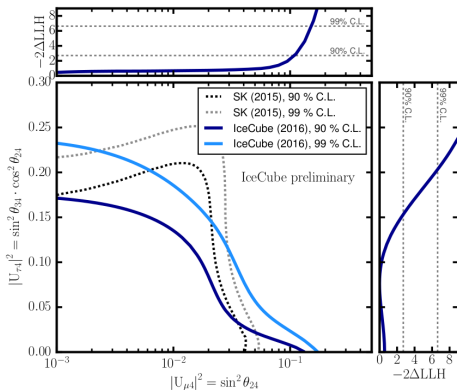- Degeneracy between tau appearance and any BSM scenario?
- Unitarity test.

T. Stanev (astro-ph/9907018)
de Gouvea, K. Kelly, G.V. Stenico, P. Pasquini (1904.07265)

Working group:
Carlos Argüelles, Irina Mocioiu

Sterile neutrinos

- What can we learn using atmospheric neutrinos in DUNE?
- Unitarity violation.

Parke and Ross-Lonergan (1508.05095)
Fong, Minakata and Nunokawa (1609.08623, 1712.02798)
Blennow, Fernandez-Martinez, Gerhlein, Hernandez-Garcia, Salvado (1803.02362)

Working group:
Carlos Argüelles, Ivan Martinez-Soler