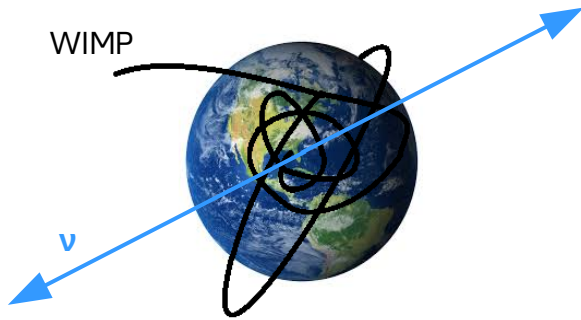
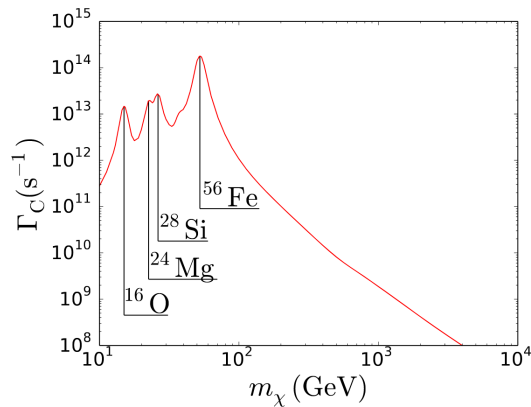


Katarzyna Frankiewicz

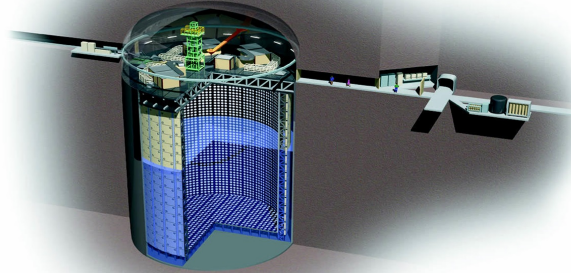
on behalf of the Super-Kamiokande Collaboration



In the Earth's core, the **spin-independent (SI)** interactions dominate in the capture process.

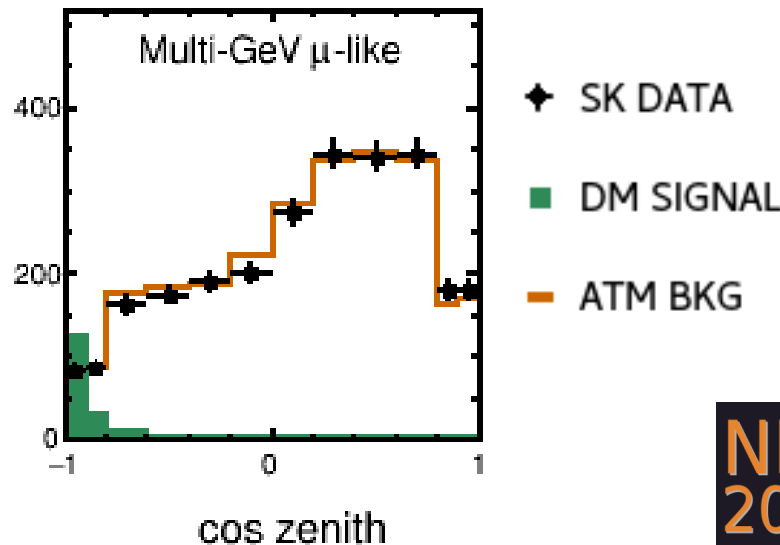


If the **WIMP mass** matches the mass of a **heavy element** in the Earth, the **capture rate** will **increase** considerably.



20 years of atmospheric neutrino data collected with the Super-K is used $\sim 50\,000$ events

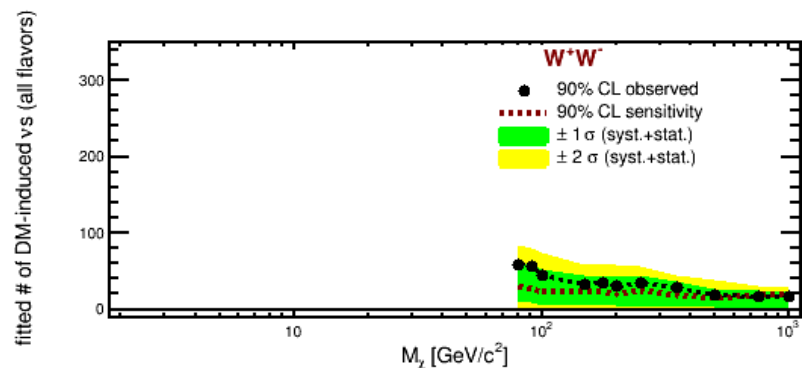
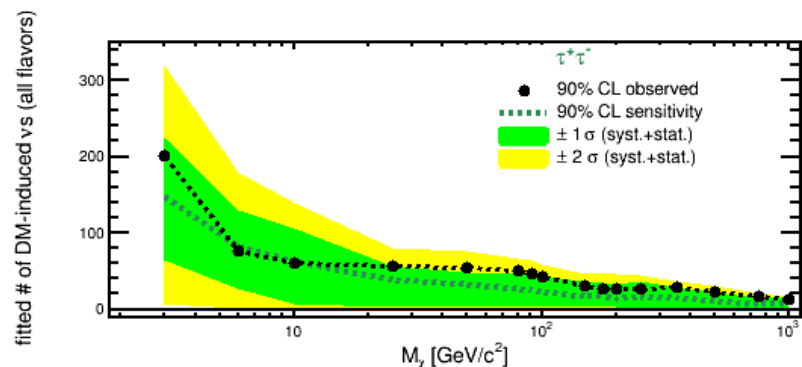
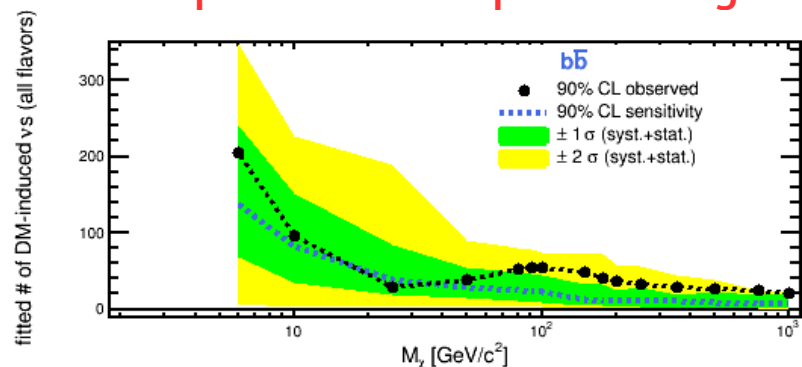
For each tested WIMP mass and annihilation channel, we find the configuration of **ATM BKG** + **DM SIGNAL** that would match **DATA** the best.



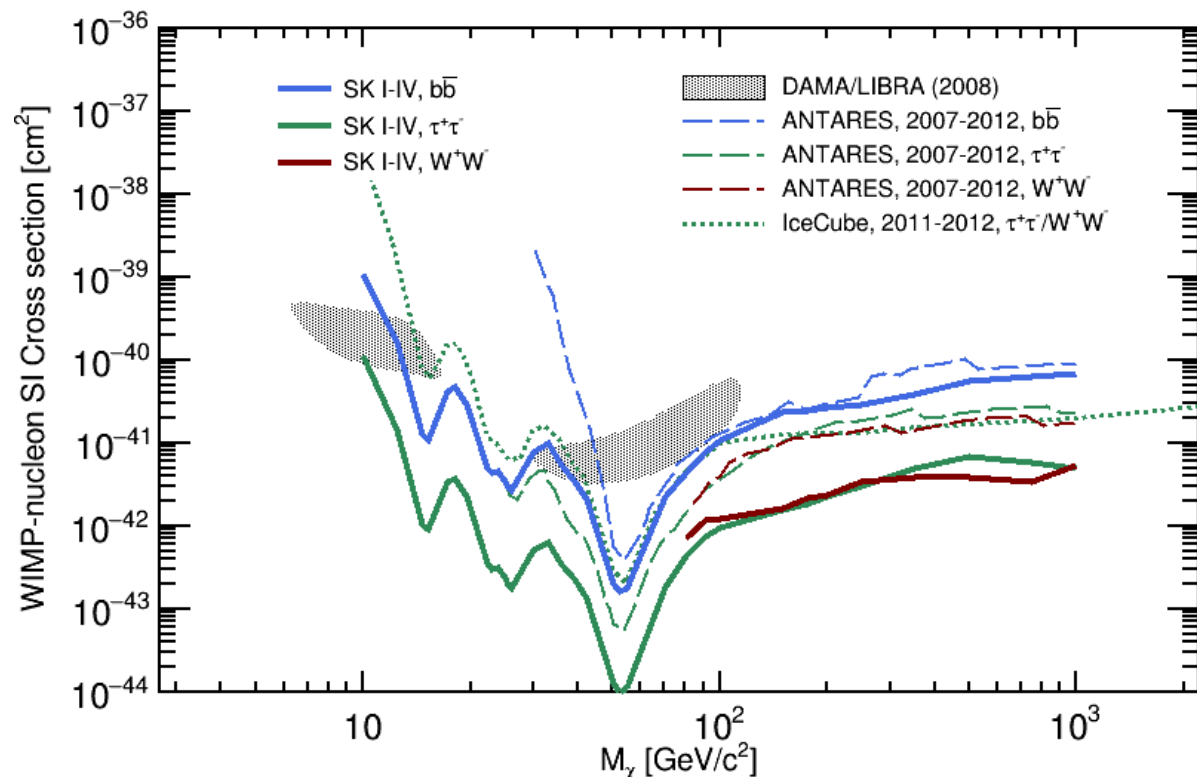
19 samples, binned in lepton momentum & $\cos\theta_z \rightarrow 595$ bins

No excess of dark matter induced neutrinos has been observed as compared to atmospheric ν bkg

90% CL limits on WIMP-nucleon SI scattering x-section



- ✓ wide range of tested WIMP masses
- ✓ three dark matter annihilation channels considered
- ✓ unique sensitivity for low energies



The peaks correspond to **resonant capture** on the most abundant elements: ^{16}O , ^{24}Mg , ^{28}Si and ^{56}Fe , and their isotopes.

- The **strongest limits** among all neutrino experiments up to date.
- Majority of the WIMP parameter space favored by the DAMA/LIBRA results is ruled out.

→ poster #134