

# DESY Seminar

Tuesday, 09.09.2008, 17h

DESY Hörsaal

## Status and perspectives of double beta decay searches

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Double beta decay is a very rare nuclear decay process in nature characterized by changing the ordering number  $Z$  by two units and leaving the mass number  $A$  constant. It can basically occur in two modes, with the emission of two electrons and two anti-neutrinos or the emission of two electrons only. While the first mode is expected within the current Standard Model, the neutrino-less double beta decay of nuclei is not allowed and is of outstanding importance for neutrino physics. It can only occur if a neutrino is its own antiparticle and if it is massive. Especially for the first property double beta decay is considered as gold-plated process. However, due to the known smallness of the neutrino mass, the process is very rare and requires special low radioactive background environments. After a general introduction into double beta decay, the seminar focusses on the current experimental searches and results and their implications for particle physics. An outlook towards future projects and the involved challenges is given, including a discussion on nuclear matrix elements and possible supporting experimental activities.

- **Tea and cookies will be served at 16.45h in the lobby**
- **After the seminar there is a chance for private discussions with the speaker over wine and pretzels**