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Abstract for an Invited Paper for the APR07 Meeting of the American Physical Society

## Results from Super Kamiokande

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I will present results from the Super-Kamiokande(SK) experiment from both the atmospheric and low energy neutrino analyses. These analyses are based on the entire SK-I and SK-II data sets, which were taken 1996-2001 and 2003-2005, respectively. For atmospheric neutrinos we have tested exotic modes and find that the SK zenith angle and L/E analyses strongly constrain sterile neutrino models as well as decoherence scenarios. The solar neutrino oscillation analyses have been updated with the SK-II data and the results are consistent with previous results by SK and SNO. Although minimal SUSY-SU(5) models have already been ruled out by  $p \to e^+\pi^0$  and  $p \to K^+\bar{\nu}$  modes, it is important to test GUTs with  $\Delta(\text{B-L})$  violating processes, since violation of (B-L) makes neutrino-less double beta decay possible. I will report on the preliminary limit by SK of one such mode,  $n - \bar{n}$  oscillations. A core-collapse supernova releases most of its gravitational energy in the form of neutrinos. These neutrinos thus carry information about the history of star formation in the early universe. We have set a limit on the relic neutrino flux using SK-II and found that it is consistent with that of SK-I. In addition, there is no evidence for a supernova burst in the SK-I and SK-II data period so we have derived a burst rate limit for our galaxy. Finally, I will discuss the status of SK-III, the recent upgrade from the half PMT coverage of SK-II, to full coverage. Data taking has been running smoothly since its start last June, and I will discuss preparations for the 2009 start of the T2K beam.