



Particle
Quarks

eory

$$L_{int} = \frac{g}{\sqrt{2}} \left(\begin{matrix} V_{ud} & V_{us} & V_{ub} \\ V_{cd} & V_{cs} & V_{cb} \\ V_{td} & V_{ts} & V_{tb} \end{matrix} \right) \left(\begin{matrix} d \\ s \\ b \end{matrix} \right) + \text{Hermitian conjugate}$$

K2K beam direction
indicated by diamond

Super-Kamiokande

Run 7436 Event 140541
99-06-19-19:18:42:4
Inner: 516 hits, 1018 pE(in-time)
Outer: 2 hits, 2 pE(in-time)

K2K
Run 101
99

Why are neutrinos
at all? Those qu
may be answered
The first neutrino
with the SuperKa
while this building

atching gravitational wave
LIGO V... 500 TAMA300