



**Figure 1:** (left) Neutrino momentum sphere in the case of pions. (right) The correlation between the neutrino energy  $E_\nu$  and the parent pion energy  $E_\pi$  at different scattering angles  $\theta_\nu = 0, 0.5^\circ, 1^\circ$ , and  $2^\circ$  off-axis.