

# Poincaré group, $CPT$ and flavor states

Luca Smaldone

email: lsmaldone@sa.infn.it

We study the explicit form of Poincaré and discrete transformations of flavor states in a two-flavor scalar model presenting field mixing. We find that, because of its condensate structure, both Poincaré and  $CPT$  symmetries are spontaneously broken on flavor vacuum. Its symmetry is just the Euclidean symmetry for each flavor,  $E(3)_A \times E(3)_B$ . By extending the Fabri-Picasso theorem we show that flavor vacua corresponding to a different time and to different Lorentz frames are unitarily inequivalent, and that they form a flavor vacuum manifold of equal-charged states.