For the transition operator $P = \bar{I}^- + \bar{U}^- + \bar{V}^-$, the final state is

$$|\phi^{'}\rangle = P|\phi\rangle = -(\frac{\sqrt{3}}{3}\alpha_1 + \frac{\sqrt{2}}{2}\alpha_2 - \frac{\sqrt{6}}{6}\alpha_3)|\pi^+\rangle + (\frac{\sqrt{3}}{3}\alpha_1 - \frac{\sqrt{2}}{2}\alpha_2 - \frac{\sqrt{6}}{6}\alpha_3)|K^0\rangle + (\frac{\sqrt{3}}{3}\alpha_1 + \frac{\sqrt{6}}{3}\alpha_3)|K^-\rangle \quad (11)$$

with normalizing condition $\mu + \nu = 1$ and $\mu = \frac{\lambda}{2}$. It is very easy to verify that the entanglement degree of the final state $|\phi^{'}\rangle$ is equal to the one of the initial state, namely, $C_{\phi'} = C_\phi$.

Same thing happens on transition operator $P = \bar{I}^+ + \bar{U}^+ + \bar{V}^+$, corresponding to whom the final state reads

$$|\phi^{'}\rangle = P|\phi\rangle = -(\frac{\sqrt{3}}{3}\alpha_1 + \frac{\sqrt{2}}{2}\alpha_2 - \frac{\sqrt{6}}{6}\alpha_3)|K^+\rangle + (\frac{\sqrt{3}}{3}\alpha_1 - \frac{\sqrt{2}}{2}\alpha_2 - \frac{\sqrt{6}}{6}\alpha_3)|\pi^-\rangle + (\frac{\sqrt{3}}{3}\alpha_1 + \frac{\sqrt{6}}{3}\alpha_3)|\bar{K}^0\rangle \quad (12)$$

with normalizing condition being $\mu + \nu = 1$ and $\mu = \frac{\lambda}{2}$. Again, calculation shows that $C_{\phi'} = C_\phi$.

Without any difficulty, it can be verified that transition operators $P = \bar{I}^- + \bar{V}^+$, $P = \bar{I}^+ + \bar{U}^-$, and $P = \bar{U}^+ + \bar{V}^-$ lead to total disentangled final states, independent of the choice of α_1 and α_2 in the initial state.

V. CONCLUSIONS

In conclusion, we have investigated the entanglement degrees of pseudoscalar meson states via quantum algebra $Y(su(3))$. By making use of transition effect of generators J of $Y(su(3))$, we have constructed various transition operators in terms of J, and have acted them on η-π^0-η' mixing meson state. The entanglement degrees of both the initial state and final state have been calculated with the help of entropy theory. Our result shows that a state with desired entanglement degree can be achieved by acting proper chosen transition operator on an initial state. This is very helpful to control the degree of entanglement in quantum communication. Entanglement has been considered as an essential resource in most applications of quantum information[1]. Although the quantum channels used in quantum teleportation are usually represented by a maximally entangled pair[25], partially entangled quantum channel becomes a hot topic[26] nowadays due to the noise factors in the realistic