

A N-partite pure state is in the form :  $|\Psi\rangle_{A_1, \dots, A_N} \neq |\Psi\rangle_{A_1} \otimes \dots \otimes |\zeta\rangle_{A_N}$  is called entanglement state. where the subindex represent of the local rank of subspace. if it could write in the following form : A N-partite pure state is in the form :  $|\Psi\rangle_{A_1, \dots, A_N} \neq |\Psi\rangle_S \otimes |\zeta\rangle_{S-}$  is called genuinely multiparty entangled state(GME).

on the other hand, A N-partite pure state is in the form :  $|\Psi\rangle_{A_1, \dots, A_N} = |\Psi\rangle_S \otimes |\zeta\rangle_{S-}$  is called biproduct state.

if we use this definition to mixed state:

$$\rho_A = \sum_{S|S-} [p_{S|S-}] \sum_i [q_{S|S-}^i \varrho_s^i \otimes \sigma_s^i] \quad (1)$$