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Quantum Phase Transitions and Entanglement in the Detuned Dicke Model RU-FEN LIU, Phys. Depart., National Cheng Kung Univ., CHIA-CHU CHEN, Phys. Depart., National Cheng Kung Univ. — The quantum phase transition of mono-mode Dicke models with two atoms is discussed and analytical results are presented. For arbitrary detuning, the exact spectrum and the concurrence of entanglement are calculated for the two-atom system. It is shown that sequential quantum phase transitions occur in this system. Evidences have been found to support that quantum phase transition and concurrence are uncorrelated in this particular model. Furthermore, the results of quantum phase transition with extra mode are also discussed.

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