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**Violation of classical inequalities and EPR correlations in a two-mode three-level atomic system** EYOB SETE, New Mexico State University — We investigate violation of Cauchy-Schwarz and Bell inequalities in two-mode three-level cascade system with injected atomic coherence in the framework of quantum theory of multiwave mixing. We show that Cauchy-Schwarz inequality is strongly violated when there is strong entanglement in the system. It also appears that Bell inequality is violated in region where there is weak entanglement while well preserved where there is strong entanglement in the system. We thus note that there are states which are entangled but do not violate Bell inequality. We also show that this system can be used to prepare states that exhibits EPR correlations.

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