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Effect of Dzyaloshinskii-Moriya interaction and external fields on quantum entanglement in one-dimensional quantum wires LEONARDO LIMA, Centro federal de educacao tecnologica — The Dzyaloshinskii-Moriya (DM) interaction is the source of various unique emergent phenomena in the field of magnetism and its investigation is of potential impact in the field of quantum information that has been an interesting topic in nowadays. We aim to study the effect of uniform Dzyaloshinskii-Moriya interaction (antisymmetric spin coupling) and arbitrary oriented external magnetic fields in the $\hat{x}$ and $\hat{z}$ directions h_x, h_y, on quantum entanglement is investigated in the quantum spin-1/2 one-dimensional Heisenberg antiferromagnetic model. The Von Neumann entropy of quantum entanglement is calculated employing Abelian bosonization and density matrix renormalization group. We investigate the influence of quantum phase transition of three competing phases (Néel phase, dimerized phase and gapless Luttinger liquid phase) on quantum entanglement at zero-temperature.

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