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Higgs-like effect and particle production induced by gravitational wave background DOUGLAS SINGLETON, PATRICK MCDOUGALL, MICHAEL RAGSDALE, CSU Fresno, PRESTON JONES, Embry Riddle Aeronautical University — We show that a *massless* scalar field in a gravitational wave background can develop a non-zero and space-time dependent vacuum expectation value. We draw comparisons to the generation of a non-zero vacuum expectation value for a scalar field in the Higgs mechanism and with the dynamical Casimir vacuum. This gravitational wave generated vacuum expectation value can be connected to particle production from gravitational waves and may have consequences for the early Universe where scalar fields and their vacuum values are thought to play an important role.

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