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A Meson Mass Formula and A Two-Nucleon Potential from a Nonlinear $\lambda\phi^5$ Theory MESGUN SEBHATU[1], Winthrop University — An exact solution of a $\lambda\phi^5$ theory[2] which is a special case of a class of nonlinear field theories developed by Burt[3] is used to construct a propagator that has poles at $M_n = (3n+1)m_\pi$ which is the neutral scalar meson mass formula. The propagator is then used to derive a solitary wave exchange two-nucleon potential ($\lambda\phi^5$ SWEP) in the same manner as the derivation of a $\lambda\phi^4$ SWEP[4] and SG SWEP[5]. SWEPs have the virtue of describing two-nucleaon interaction with the least number (< 3) parameters. The $\lambda\phi^4$ is of a special interest because it yields a neutral scalar meson mass formula that reasonably agrees with know meson and predicts others that may exist.

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