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Short rangeness, mass intervals and other classicalities from Yang-Mills fields

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The Yang-Mills theory is revisited from the point of view of classical configurations starting from wave modes. This reveals a kind of classical solutions which reconstruct effective Klein-Gordon excitations, along with a new mass generation mechanism. The effective Klein-Gordon equation gives rise to a set of equations of motion whose solutions may exhibit a confined behavior. Furthermore, the physical consistencies for the perturbations in the scalar fields arisen from the original theory may suffice to produce interesting predictions about the mass intervals for the gauge bosons: they can exist within a causal and a real range, between tachyon and instanton limits.

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