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Title:	Diagrammatics for Wightman Correlators in General States: The Cases of the Simple Harmonic and Anharmonic Oscillators
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Abstract:	The machinery of computing vacuum expectation values of a time-ordered se- quence of position operators of the simple harmonic oscillator is already well established. It rests on a Wick theorem, which enables one to decompose such a quantity in terms of products of pairwise contractions, which are vacuum ex- pectation values of a time-ordered sequence of position operators taken two at a time. This result naturally leads to a diagrammatic approach of computing such correlators, and is already well known in the form of Feynman diagrams. We generalise this setup to encompass expectation values of a general ordered sequence of position operators (Wightman sequences) in general density matri- ces of the simple harmonic oscillator. A Wick theorem is first developed for this situation and consequently a diagrammatics is laid down. Wightman correlators in general density matrices of the anharmonic oscillator are also analysed and a diagrammatic formalism is developed for them too.
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