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Ultra-cold alkaline-earth atoms at half-filling in one dimension

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Fermionic ultra-cold alkaline-earth atomic gases have recently acquired a great interest both experimental and theoretical. Recent experiences have shown that at very low energy, interactions between such atoms hardly depend, except via the fermionic statistic, on their nuclear spin. This so particular structure provides very high degrees of symetries to these systems, in particular the realisation of a degenerate fermionic gas with an extended SU(N) symmetry, N being the number of nuclear-spin states. In this work, we study, by low-energy approach and by numerical methods,the nature of Mott-insulating phases of these ultra-cold atoms trapped on unidimensional-optical
lattices.

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