

Abstract Submitted  
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**Critical lines and massive phases in quantum spin ladders with dimerization** JAVIER ALMEIDA, MIGUEL ANGEL MATIN-DELGADO, Universidad Complutense, Madrid, Spain, GERMAN SIERRA, Instituto de Fisica Teorica, C.S.I.C-U.A.M, Madrid, Spain — We study here various types of  $S=1/2$  spin ladders with odd and even number of legs and intrinsically dimerized patterns. The low temperature physics of these systems is very rich and in fact their ground state at  $T=0$  may undergo a quantum phase transition as we vary the microscopic parameters of the lattices. To study these many-body systems we will use the density matrix renormalization group (DMRG) algorithm, and will present accurate estimations of the critical lines found in these models as well as different measurements to characterize the nature of the ground state. We will see that the valence bond solid picture seems to be a proper description of the massive phases on each side of the phase diagram and will show evidences of this nature by means of a particular order parameter denoted generalized string order parameter.

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