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Employing spin symmetry to disentangle different models for the XYZ states

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In order to test different models proposed for some states discovered recently in the charmonium mass range that do not fit into the pattern predicted by the conventional quark model, we derive predictions for the spectrum within the hadro-charmonium picture, the tetraquark picture as well as the hadronic molecular approach. We exploit heavy quark spin symmetry for the hadro-charmonium and hadronic molecule scenarios. The patterns that emerge from the different models turn out to be quite distinct. For example, only within the hadro-charmonium picture a pseudoscalar state emerges that is lighter than the Y(4260). Possible discovery channels of these additional states are discussed.

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