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## On the nature of an excited state

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In many lattice simulations with dynamical quarks, radial or orbital excitations of hadrons lie near multihadron thresholds: it makes the extraction of excited states properties more challenging and can introduce some systematics difficult to estimate without an explicit computation of correlators using interpolating fields strongly coupled to multihadronic states. In a recent study of the strong decay of the first radial excitation of the  $B^*$  meson, this issue has been investigated and we have clues that a diquark interpolating field  $\bar{b}\gamma^i q$  is very weakly coupled to a  $B\pi$   $P$ -wave state while the situation is quite different if we consider an interpolating field of the kind  $\bar{b}\vec{\nabla}^i q$ , where  $\vec{\nabla}$  is a covariant derivative: those statements are based on examining the charge density distribution.

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