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Some aspects of the giant pairing vibration

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The Giant Pairing Vibration (GPV), a correlated two-nucleon mode in the second shell above the Fermi surface, has long been predicted [1] and expected to be strongly populated in two-nucleon transfer cross sections similar to those of the normal Pairing Vibration (PV). Recent experiments have provided evidence for this mode in ^{14,15}C [2] , but despite sensitive studies, it has not been definitively identified either in Sn or Pb nuclei where pairing correlations are known to play a crucial role [3].
In this work, we looked at whether features inherent to the mixing of bound and unbound levels might account for this intriguing puzzle. We study the effect
of the mixing of unbound levels in a set of toy models that capture the essential physics of the GPV, along with a more realistic calculation including Distorted Waves Born Approximation (DWBA) transfer amplitudes.

The calculated (relative) cross section to populate a simulated GPV state is effectively low, compared to the case of bound levels with no-widths,
and the mixing turns out to be only a minor contributor to the weak population. Rather, the main reason is the melting of the GPV peak due to the width it
acquires from the low orbital angular momentum single particle states playing a dominant role in two-nucleon transfer amplitudes. This effect, in addition to a severe Q-value mismatch [4], may account for the elusive nature of this mode in
(t,p) and (p,t) reactions.

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