Octupole Correlations in ^{72}Ge

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Mean-field theories predict the emergence of strong shell gaps for particle numbers 32 and 40 when the nucleus adopts a non-axial octupole (tetrahedral) shape. There is therefore good reason to expect ^{72}Ge, with $Z = 32$ and $N = 40$, to be a strong candidate to exhibit such shapes, and this nucleus was therefore studied via the ^{70}Zn(α,2n)^{72}Ge reaction at a beam energy of 30 MeV. Coincident γ-rays were measured with the AFRODITE spectrometer comprising nine Clover detectors. We found no evidence for tetrahedral states in our data. However, our extension of the previously existing level scheme included a new, negative-parity, even-spin band. This band is likely the unfavoured signature partner of the band built on the previously-known $I^{\pi} = 3^{-}$ state at 2515 keV. The two negative-parity bands are interpreted as involving an aligned octupole vibration which evolves to a four-quasiparticle structure at higher spins. This talk presents spectroscopic evidence for the new band, summarizes the spin-parity assignments, and discusses the proposed configuration.