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Low-lying transition strengths in the neutron-deficient Te-isotopes

An enhancement of the B(E2, $2_1^+ \rightarrow 0_1^+$) and unexpectedly low B(E2, $4_1^+ \rightarrow 2_1^+$) values was found in $_{50}$Sn isotopes below mid-shell. However, the puzzling B(E2, $2_1^+ \rightarrow 0_1^+$) systematics around N = 60 was understood very recently in state-of-the-art Monte-Carlo shell model calculations [1] by activating protons in the 1g9/2 orbit and a second-order quantum phase transition from the moderately deformed phase to the pairing (seniority) phase that occurs around N = 66. But a sharp drop of the B(E2, $4_1^+ \rightarrow 2_1^+$) values below N = 66 leading to unusual small $B_{4/2}$=B(E2, $4_1^+ \rightarrow 2_1^+$)/B(E2, $2_1^+ \rightarrow 0_1^+$) ratios is not understood so far.
In neighboring $_{52}$Te isotopes a similar situation seems to be present, where especially data on B(E2, $4_1^+ \rightarrow 2_1^+$) values are lacking that would allow a clear conclusion. An exclusive data point for the neutron-deficient Te isotopes with N < 66 also shows a low $B_{4/2}$ ratio in ^{114}Te and is a conundrum [2]. In this framework ^{112,116}Te represent interesting cases as it is just at the edge of the shape transition observed in neighboring Sn isotopes and is also supported by experimental data on ^{114}Te.
Therefore, we determined B(E2) values between the lowest states in ^{112,116}Te from level lifetimes measured with the recoil distance Dopplershift method (RDDS). We will present these results and relate them both to the systematics along the Te isotopic chain and to the interpretation of the Sn isotopes.

[1] T. Togashi et al., Phys. Rev. Lett. 121, 062501 (2018)
[2] O. Möller et al., Phys. Rev. C 71, 064324 (2005)

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