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## On the Atomki nuclear anomaly after the MEG-II result

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Recent experimental results from the Atomki collaboration have reported the observation of anomalous effects in Beryllium, Helium and Carbon nuclear transitions that could hint at physics beyond the Standard Model. However, the MEG-II experiment has recently found no significant anomalous signal in the Beryllium transition <sup>8</sup>Be  $\rightarrow$  <sup>8</sup>Be +  $e^+e^-$ . In view of this result, we critically re-examine the possible theoretical interpretations of the anomalies observed by the Atomki experiment in terms of a new boson X with mass around 17 MeV. The present work aims to study the phenomenology of a spin-2 state and revisit the possibility of a pure CP-even scalar, which was initially dismissed due to its inability to explain the Beryllium anomalous signal. Our analysis shows that a spin-2 state is highly disfavoured by the SINDRUM constraint while a scalar boson could explain the Helium and Carbon anomalies while being compatible with other experimental constraints.

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