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X atom

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The $X(3872)$, whose mass coincides with the $D^0\bar{D}^{*0}$ threshold, is the most extended hadron object. Since its discovery in 2003, debates have never stopped regarding its internal structure.
We propose a new object, the X atom, which is the $D^{\pm}D^{*\mp}$ composite system with positive charge parity and a mass of (3879.89 ± 0.07)˜MeV, formed mainly due to the Coulomb force. We show that a null signal of the X atom can be used to put a lower limit on the binding energy of the $X(3872)$. From the current knowledge of the $X(3872)$ properties, the production rate for the X atom relative to the $X(3872)$ in B decays and at hadron colliders should be at least 1×10^{-3}. New insights into the $X(3872)$ will be obtained through studying the X atom.

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