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A desktop particle accelerator employing a pyroelectric crystal
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Pyroelectric crystals have long been known to generate large electric fields during a modest change in temperature. This effect is due to rearrangement of the crystalline structure which results in a large bound charge on the surface of the crystal. The bound charge and associated electric field are directly related to the temperature change, making large voltages possible. Due to the compact size of the crystal and the absence of a large power supply, pyroelectric crystals offer a potential means for developing portable particle accelerators and x-ray sources. It has been recently reported that using pyroelectric crystals to accelerate a deuterium ion beam into a deuterated target can produce D+D fusion. The objectives of the present work are to (a) verify the results of the D+D fusion experiments mentioned above, (b) optimize the conditions for particle acceleration, and (c) assess the possibility of extending this method to other nuclear reactions.

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