

Abstract Submitted
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Nature of chemical bond and EDM effects in molecular ions HBr^+ and HI^+ BORIS RAVAINÉ, SERGEY PORSEV, ANDREI DEREVIANKO, Physics Department, University of Nevada, Reno — Heavy polar molecules offer a great sensitivity to the electron Electric Dipole Moment (EDM). To guide emerging searches for EDMs with molecular ions, we estimate the EDM-induced energy corrections for hydrogen halide ions HBr^+ and HI^+ in their respective ground $X^2\Pi_{3/2}$ states. We find that the energy corrections due to EDM for the two ions differ by an unexpectedly large factor of fifteen. We demonstrate that a major part of this enhancement is due to a dissimilarity in the nature of the chemical bond for the two ions: the bond that is nearly of ionic character in HBr^+ exhibits predominantly covalent nature in HI^+ . We conclude that because of this enhancement the HI^+ ion may be a potentially competitive candidate for the EDM search.

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