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## Diatomic molecules as probes for variation of fundamental constants

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Diatomic molecules are very promising probes for variation of fundamental constants (VFC), as their spectra can be very sensitive to both  $\alpha$  and  $\mu$ , making it possible to look for change in both constants in a single experiment [1].

Nearly degenerate levels with different sensitivity to VFC may provide huge enhancements of the relative variation, since  $\delta\omega/\omega$  tends to infinity when the distance between the levels  $\omega$  is close to zero. However, locating such fortuitous level combinations is not a trivial task. The talk will present some schemes for identifying rovibrational transitions with optimal sensitivity to VFC in diatomic cations. Examples of promising molecules include cations of dihalogens and hydrogen halides, which benefit from very low energy rovibrational transitions between the nearly degenerate sublevels of their  $X\ 2\Pi$  ground states [2].

Second topic discussed in the presentation will be our recent investigation of sensitivity of the equilibrium bond lengths in homonuclear dimers to variation of  $\alpha$  [3], in the context of the recent proposal to search for VFC using laser interferometers [4].

[1] C. Chin, V. V. Flambaum, and M. G. Kozlov, *New J. Phys.* 11, 055048 (2009)

[2] L. F. Pašteka, A. Borschevsky, V.V. Flambaum, and P. Schwerdtfeger, *Phys. Rev. A* 92, 012103 (2015)

[3] A. Borschevsky, L. F. Pašteka, V.V. Flambaum, and P. Schwerdtfeger, in preparation

[4] Y.V. Stadnik and V.V. Flambaum, *Phys. Rev. Lett.* 114, 161301 (2015)

### Summary

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