

Tools to study radioactive molecules at ISOLDE-CERN

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Molecules that are composed of at least one unstable isotope offer a versatile platform upon which a diverse range of physical phenomena can be explored. In fundamental physics studies, subtle effects resulting from the violation of fundamental symmetries can be dramatically amplified in certain classes of molecules [1-4]. These additional dimensions enable a particular molecule to be engineered to possess an unparalleled sensitivity to a particular symmetry-violating effect that far exceeds the systems that currently set the strictest limits on new physics beyond the Standard Model. In addition to being of marked interest for fundamental physics, these molecules are of significance in other areas of research encompassing nuclear structure [5], chemistry [6] and astrophysics [7].

This contribution outlines the technique used to realize the first laser spectroscopy study of a short-lived molecule at ISOLDE-CERN [8]. An overview of techniques that can be used to study radioactive molecules at the facility will be given including an outlook on the next steps of the program in the upcoming years.

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