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Spectroscopy with an unlocked frequency comb BACHANA LOM-SADZE, Kansas State University, HYOUNGUK JANG, Kansas State Univ., CHARLES FEHRENBACH, ERIC SCHULTZ, BRETT DEPAOLA, Kansas State University — In recent years, the use of frequency combs has greatly increased. They are used in atomic clocks and optical frequency metrology and synthesis. They are widely used in the spectroscopy of atomic and molecular systems as well. All experiments using frequency combs require high precision control on the two characteristic parameters of a frequency comb: repetition frequency (f_{rep}) and offset frequency (f_0); achieving this active control is often the most difficult aspect of frequency comb experiments. Here, we demonstrate high resolution spectroscopy using a frequency comb without the active stabilization of f_{rep} and f_0 . The underlying idea is that those frequencies can be measured *a posteriori* each time an excitation is observed. The natural tendency of f_{rep} and f_0 to drift with time becomes equivalent to a controlled scan of those frequencies.

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