

## FREQUENCY COMB ASSISTED IR MEASUREMENTS OF $\text{H}_3^+$ , $\text{H}_2\text{D}^+$ AND $\text{D}_2\text{H}^+$ TRANSITIONS

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We present recent measurements of the fundamental transitions of  $\text{H}_3^+$ ,  $\text{H}_2\text{D}^+$  and  $\text{D}_2\text{H}^+$  in a 4 K 22-pole trap<sup>b</sup> by action spectroscopic techniques. Either Laser Induced Inhibition of Cluster Growth (He attachment at  $T \approx 4$  K), endothermic reaction of  $\text{H}_3^+$  with  $\text{O}_2$ , or deuterium exchange has been used as measurement scheme. We used a 3  $\mu\text{m}$  optical parametric oscillator coupled to a frequency comb<sup>c</sup> in order to achieve accuracy generally below 1 MHz. Five transitions of  $\text{H}_3^+$ , eleven of  $\text{H}_2\text{D}^+$  and ten of  $\text{D}_2\text{H}^+$  were recorded in our spectral range. We compare our  $\text{H}_3^+$  results with two previous frequency comb assisted works<sup>de</sup>. Moreover, accurate determination of the frequency allows us to predict pure rotational transitions for  $\text{H}_2\text{D}^+$  and  $\text{D}_2\text{H}^+$  in the THz range.

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