

## THE PURE ROTATIONAL SPECTRA OF LANTHANUM MONOHALIDES

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The pure rotational spectra of the  $X^1\Sigma^+$  ground states of all lanthanum monohalides have been measured using a pulsed-jet cavity Fourier microwave spectrometer in the range of 5-18 GHz. The molecules were prepared by ablating solid La with the second harmonic of a pulsed Nd:YAG laser and allowing the vapour to react with SF<sub>6</sub>, Cl<sub>2</sub>, Br<sub>2</sub> or CH<sub>3</sub>I precursor present as  $\leq 0.01\%$  in an Ar carrier gas. These are the first reported observations of any kind for lanthanum monobromide, and the first measurements of the pure rotational spectra of all species. Equilibrium geometries, vibrational wavenumbers and dissociation energies have been determined for all species. Nuclear quadrupole constants and nuclear spin-rotation coupling constants are also reported for both La and X (X=F, Cl, Br, I) and will be discussed.