# Maximising sensitivity for U-Pb geochronology applications by sector field ICP-MS using 'Bloodhound' laser ablation technology.

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The measurement of U-Pb ages in zircons by laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) has become a widely used analytical tool in geoscience. Precison and accuracy of the reported LA-ICP-MS U-Pb ages is dependent on many factors, with sensitivity one of the most important. The high sensitivity of the Thermo Scientific™ Element XR™ sector field ICP-MS with the Jet Interface has been used to determine U-Pb ages for some of the youngest zircons [1]. Increased sensitivity also allows lower sample volumes to be ablated, vital for resolving complex zonation in zircons.

The development of rapid response, high efficiency laser ablation cells [2], such as the ESI Lasers™ Bloodhound™ system [3], has resulted in increased sensitivity and an order of magnitude decrease in washout time available from commercial systems, spurred by applications in imaging of biological tissues [4].

A rapid response laser ablation cells has recently been demonstrated to improve analysis of geological material on a quadrupole-based ICP-MS [5]. From this we extrapolated combining the Bloodhound system to the high sensitivity Element XR ICP-MS we can maximise sensitivity for LA-ICP-MS U-Pb of zircons. This combination allowed for high resolution chemical and chronological mapping of descrete zones within altered zircons. Here we report U-Pb results with this system for a variety of reference sample zircons and other matrices.

[1] Guillong (2014) *J. Anal. At. Spectrom.,* **29**, 963-970 [2] van Malderen (2016) *J. Anal. At. Spectrom.,***31**, 423-439. [3] Douglas (2015) *Anal. Chem.*, **87**, 11285–11294. [4] Breglio (2017) *Nature Communications.,***8**, 1654-1662. [5] Petrus (2017) *Chem. Geo.*, **463**, 76-93.