

## **Appendix S1 from Klausen et al., “Depositional history of a condensed shallow marine reservoir succession: stratigraphy and detrital zircon geochronology of the Jurassic Stø Formation, Barents Sea”**

### **Analytical Method**

A Nu AttoM high resolution ICP-MS coupled to a 193 nm ArF excimer laser (Resonetics RESOLUTION M-50 LR) at the University of Bergen, Norway, was used to measure the Pb/U and Pb isotopic ratios in zircons. The laser was fired at a repetition rate of 5 Hz and energy of 80 mJ with 19 or 26 microns spot size. Typical acquisitions consisted of 15 second measurement of blank followed by measurement of U, Th and Pb signals from the ablated zircon for another 30 seconds. The data were acquired in time resolved – peak jumping – pulse counting mode with 1 point measured per peak for masses  $^{204}\text{Pb} + \text{Hg}$ ,  $^{206}\text{Pb}$ ,  $^{207}\text{Pb}$ ,  $^{208}\text{Pb}$ ,  $^{232}\text{Th}$ ,  $^{235}\text{U}$ , and  $^{238}\text{U}$ . Due to a non-linear transition between the counting and attenuated (= analog) acquisition modes of the ICP instruments, the raw data were pre-processed using a purpose-made Excel macro. As a result, the intensities of  $^{238}\text{U}$  are left unchanged if measured in a counting mode and recalculated from  $^{235}\text{U}$  intensities if the  $^{238}\text{U}$  was acquired in an attenuated mode. Data reduction was then carried out off-line using the Iolite data reduction package version 3.0 with VizualAge utility (Petrus and Kamber, 2012). Full details of the data reduction methodology can be found in Paton et al. (2010). The data reduction included correction for gas blank, laser-induced elemental fractionation of Pb and U and instrument mass bias. For the data presented here, blank intensities and instrumental bias were interpolated using an automatic spline function while down-hole inter-element fractionation was corrected using an exponential function.

No common Pb correction was applied to the data but the low concentrations of common Pb were controlled by observing  $^{206}\text{Pb}/^{204}\text{Pb}$  ratio during measurements. Residual elemental fractionation and instrumental mass bias were corrected by normalization to the natural zircon reference material Plešovice (Sláma et al., 2008). Zircon reference materials GJ-1 {nr. 63} (Jackson et al., 2004) and 91500 (Wiedenbeck et al., 1995) were periodically analysed during the measurement for quality control and the obtained mean values of  $600 \pm 4$  ( $2\sigma$ ) Ma and  $1086.0 \pm 9$  ( $2\sigma$ ) Ma are 2% accurate within the published reference values ( $600.5 \pm 0.4$  Ma, Schaltegger et al., 2015;

1065 Ma, Wiedenbeck et al., 1995, respectively). The concordance-discordance criterion used herein is 10%. Zircon U–Pb ages are presented as histograms and probability density plots (PDP) generated with the ISOPLOT program v. 3.70 (Ludwig, 2008).

## References

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