A cautionary tale on zircon ages from mafic-ultramafic rocks: A case example from ophiolites, SE Australia

E. A. BELOUSOVA[1*], J. M. GONZÁLEZ JIMÉNEZ[12], I. GRAHAM[3], W. L. GRIFFIN[1], SUZANNE Y. O'REILLY[1] AND N. J. PEARSON[1]

[1]GEMOC/CCFS, Macquarie Univ., Sydney, 2109, Australia (*correspondence: elena.belousova@mq.edu.au)
[2]CEGA, Universidad de Chile, Santiago, Chile
[3]BEES, University of NSW, Sydney, 2052, Australia

This study focuses on two belts of ophiolitic rocks of the Tumut region located in the Lachlan Fold Belt of SE Australia. U-Pb, Hf- and O-isotope and trace-element data were obtained for zircons from a range of rock types from the Coolac and Wambidgee Serpentinite Belts. The integrated data on zircons from chromitites, leucogabbro, plagiogranite and rodingite of the Coolac Serpentinite Belt indicate that granitoid-related melts/fluids, injected into already-emplaced mafic-ultramafic rocks, transported pre-existing zircons as well as possibly crystallising new grains [1]. This provides a new explanation for the presence of crustal zircons in some upper mantle rocks. In the case of the Coolac zircons, they carry no information on the origin of the Tumut ophiolite.

The Wambidgee Serpentinite Belt comprises more deformed and metamorphosed rocks, up to upper amphibolite-facies regional metamorphism. This belt is located further west of the Coolac Belt and at least 10km away from the contact with the intruding granitoid batholith. The data collected on zircons from the plagiogranite of the Wambidgee Serpentinite Belt are consistent with their crystallisation from mantle-derived melts, in contrast to those from the Coolac Belt. They show juvenile Hf-isotope composition (εHf from +7 to +14) and $\delta^{18}O$ values, ranging from 4.35 to 5.07‰, close to typical mantle values and clearly within the range defined for zircons from plagiogranites of other ophiolitic complexes worldwide (3.9–5.6‰; [2]). In this case, the U-Pb age of 486± 3.2 Ma defined for the Wambidgee zircons constrains the timing of crustal extension and formation of oceanic lithosphere in the Tumut region of SE Australia.

[1] Belousova *et al*. (2015) *Geology* **43**, 119-122. [2] Grimes *et al*. (2013) *Lithos* **179**, 48–66.