

## **Appendix 1. EBSD analytical conditions.**

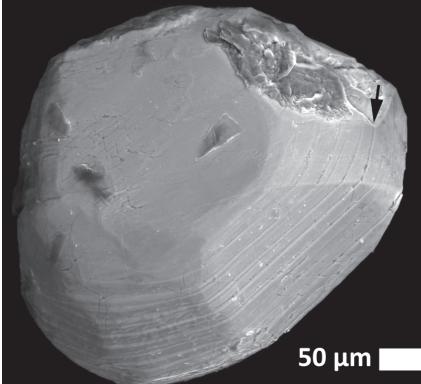
Hitachi SU6600 SEM  
Field Emission Gun  
Shottkey source  
Oxford Nordlys EBSD detector

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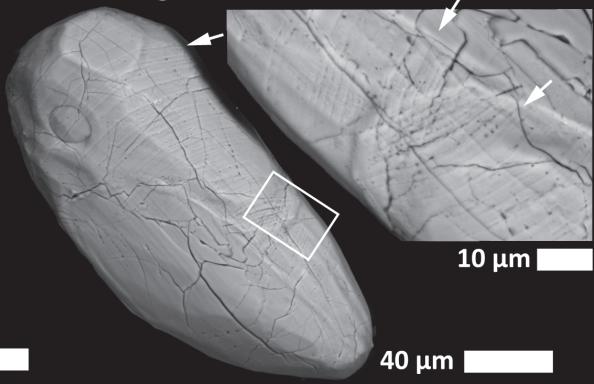
EBS conditions: 20kV  
Condenser lenses: medium 6-8  
Probe current: 5-4 nA  
Anode aperture: 3  
Objective aperture: 2  
Time per frame: 23 ms  
Noise reduction: 4 frame  
High resolution: 60  
Detect 5-7 bands

**Appendix 2. BSE surface images of detrital shocked zircons.**

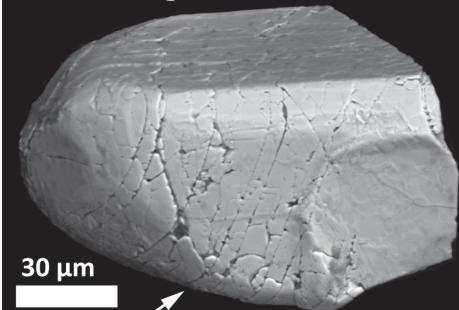
**A. 10SU14 grain 15**



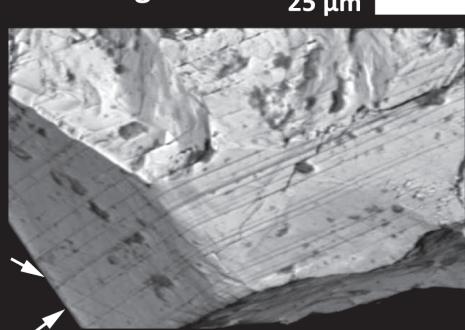
**B. 10SU14 grain 19**



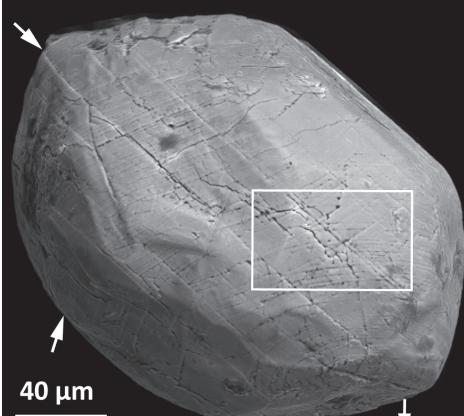
**C. 10SU31 grain 06**



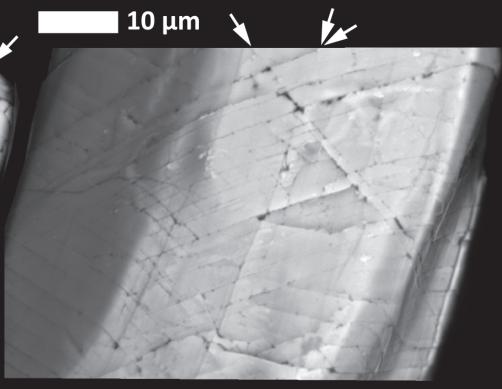
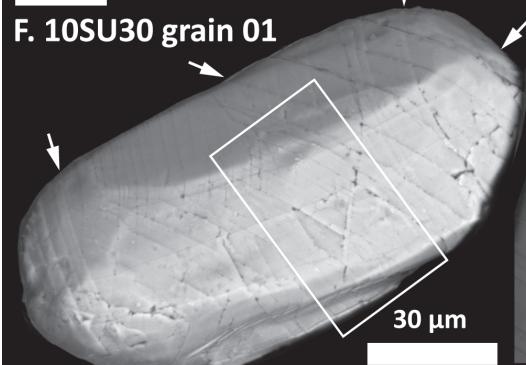
**D. 10SU42 grain 38**



**E. 10SU14 grain 36**



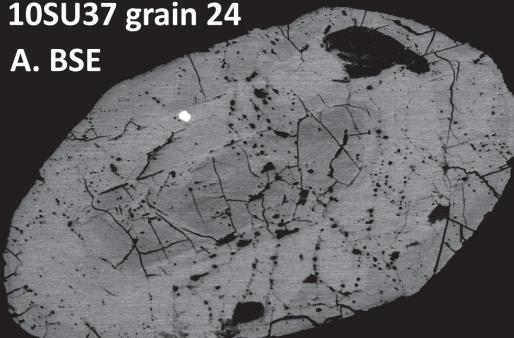
**F. 10SU30 grain 01**



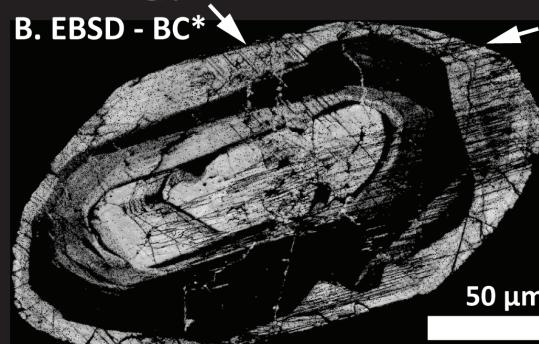
### Appendix 3.1. Interior grain images of detrital shocked zircons.

10SU37 grain 24

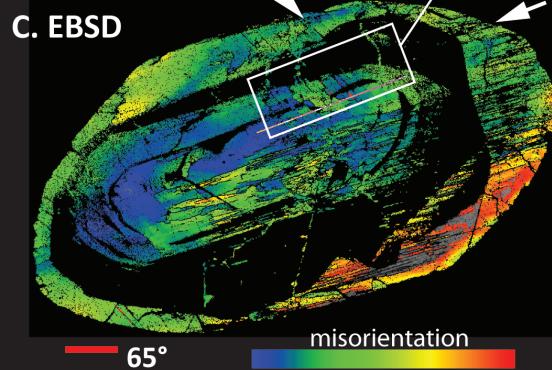
A. BSE



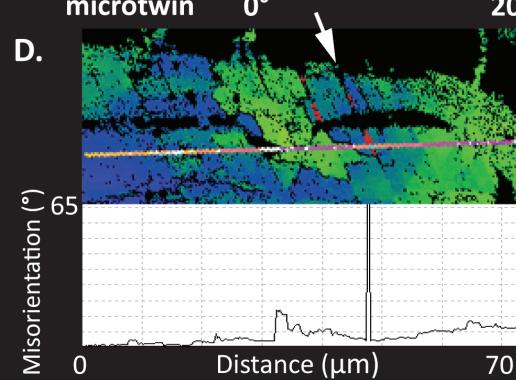
B. EBSD - BC\*



C. EBSD



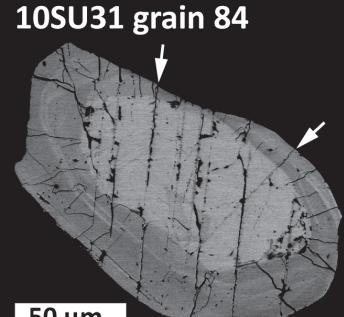
D.



\*BC = band contrast

10SU31 grain 84

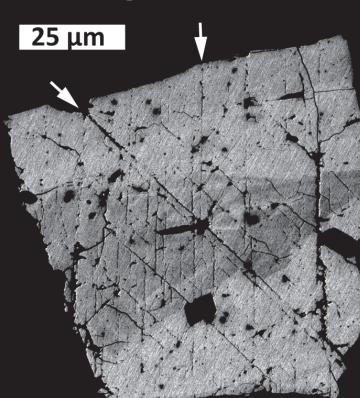
A. BSE



50 μm

10SU23 grain 119

A. BSE



25 μm

10SU34 grain 93

A. BSE

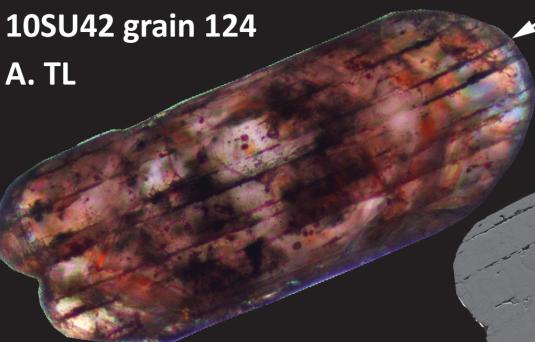


50 μm

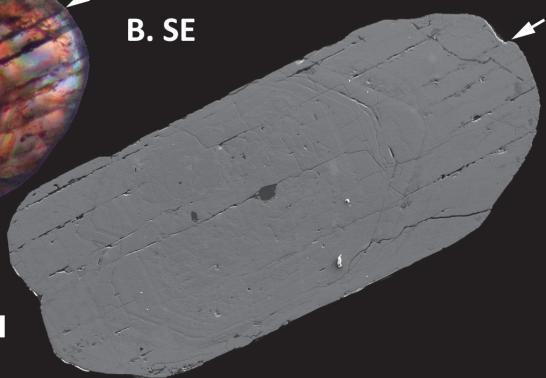
**Appendix 3.2. Interior grain images of detrital shocked zircon.**

**10SU42 grain 124**

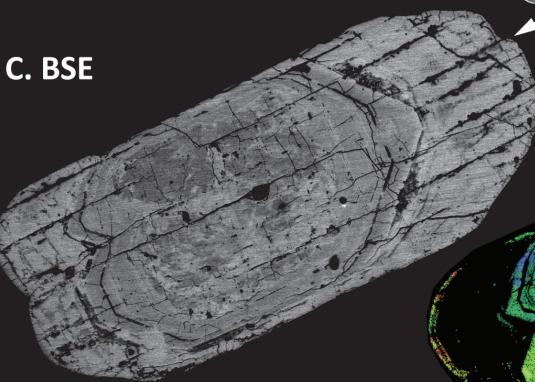
**A. TL**



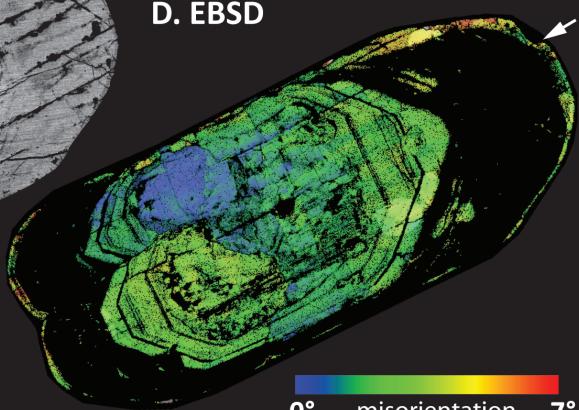
**B. SE**



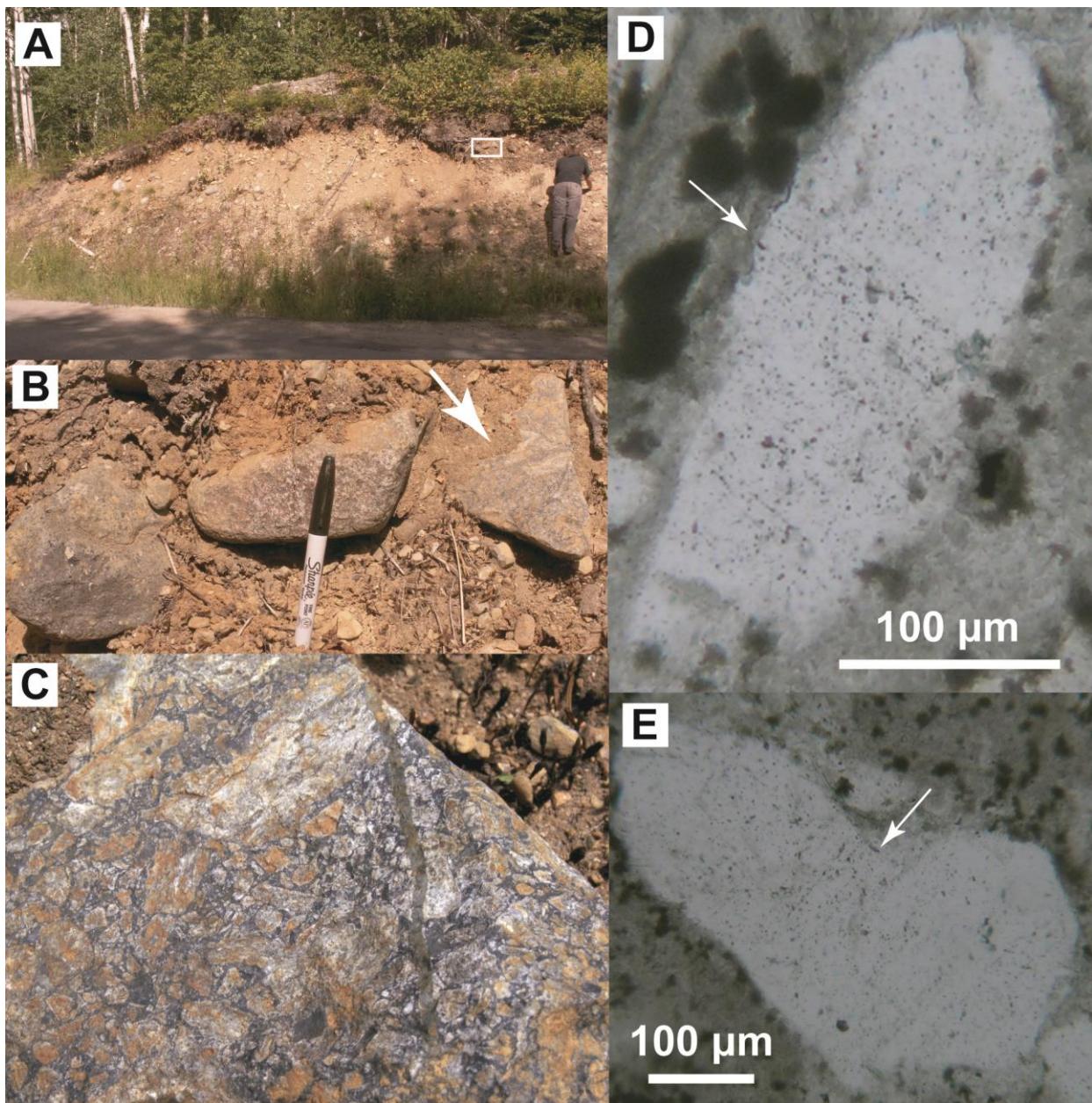
**C. BSE**



**D. EBSD**



0° misorientation 7°



Appendix 4. Boulder of Onaping Formation in a Holocene glacial deposit. (A) Roadcut exposing a Holocene delta on Frenchman Lake Road, North Range of the Sudbury basin. (B) Close-up image of inset box in A; arrow points to sample 10SU28. (C) Sample 10SU28. The rock is composed primarily of altered vitric fragments and possible melt veins, and is interpreted to have originated from the 'equant shard unit' of the Sandcherry Creek member of the Onaping Formation (Ames et al., 2002). (D-E) Grains of quartz in sample 10SU28 that contain one orientation of possible decorated PDFs.