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We are grateful to Dutch et al. (2007) for the opportunity to give some details regarding our geochronological work—details that could not be included in our short paper.

We understand that Dutch et al. broadly agree with our triaxial model to explain the structures of the east margin of the Gawler Craton. However, they believe the structural fabric is due to the Paleoproterozoic Kimban orogeny (1730–1690 Ma) only, with no contribution from the Neoarchean Sleafordian orogeny (2550–2450 Ma).

We certainly agree that along its east border, the Gawler Craton and its Paleoproterozoic cover have recorded a strong Kimban deformation. This transpressive deformation is particularly clear and well documented along the Kalinjala shear zone, east of the Eyre Peninsula and along gauges parallel to Price Island metasedimentary basin, west of the Eyre Peninsula. In Vassallo and Wilson (2001, 2002) and Tong et al. (2004), the age of the deformation in the vicinity of the Kalinjala shear zone is solely constrained by the age of the youngest sheared rock formations (the Hutchinson Group and the Donnington Suite). About the underlying Neoarchean basement, and in the absence of radiometric constraint, these researchers implicitly assume that there is no fabric older than Paleoproterozoic.

In their Comment, Dutch et al. refer to a 1702 ± 12 Ma monazite from the Sleaford Complex at Fishery Bay. This age confirms the Proterozoic overprint in the basement but does not rule out older fabrics. Regarding SHRIMP zircon ages between 1701 and 1710 Ma from the high-grade fabrics in the 1850 Ma Donnington Suite (Reid et al., 2007), we are not surprised by such a Kimban age, as the Donnington Suite, mainly represented by the Lincoln Batholith, is adjacent to the Kalinjala Shear Zone in the southeast Eyre Peninsula.

As pointed out by Dutch et al., Fanning et al. (2007) dated a Kimban medium-grained granodiorite from the Minbrie gneiss at Refuge Rocks—a region with a strong N-S fabric. However, Dutch et al. omit that in the same paper, Fanning et al. (2007) also dated a strongly foliated megacrystic augen gneiss known as the second component of the Minbrie gneiss at Refuge Rocks (Parker et al., 1988). This strongly N-S–foliated megacrystic augen gneiss records a Sleafordian age of 2411 ± 5 Ma. Fanning et al. (2007, p. 80) conclude that "the extent to which apparently Kimban aged reworking has overprinted any prior foliation within the earliest Palaeoproterozoic Minbrie Gneiss is uncertain."

Despite clear geochronological clues (cf. above), the possibility of a Sleafordian fabric in the Sleaford Complex has been rarely discussed in previous papers. Our paper challenges that view by arguing that, to the west and away from the Kalinjala Shear Zone where the Kimban overprint is weaker or absent, a pervasive Neoarchaean constrictional high-grade fabric synchronous with the Sleafordian collisional orogeny (Fanning et al., 2007) marks the bulk of the Gawler structural fabric.

Away from the Kalinjala Shear Zone, the 1850 Ma Donnington intrusives, represented by a cordierite-bearing granite, are undeformed (Fig. 1B) (2 km west of location C in Figure 4 of Duclaux et al., 2007). Yet, the surrounding Sleafordian complex shows a pervasive garnet-bearing anatectic fabric (Duclaux et al.'s Figs. 4A and 4B). This field relationship gave us the opportunity to date both the intrusive rock and the early fabric in the Sleafordian basement. Monazite grains from the cordierite-bearing granite give an electron probe microanalysis (EPMA) age of 1827 ± 10 Ma (n = 15, MSWD = 1.044) (Fig. 1A). In contrast, monazite inclusions in garnet from a Sleafordian anatectic leucosome show that the regional fabric is Sleafordian (ca. 2.48 Ga) in age, not Kimban (1.7 Ga). This age matches the age of the granulites at Cape Carnot and the age of the high-grade gneiss in the Terre Adélie craton. The similar orientation of the Sleafordian and Kimban fabric should not be a surprise because both parallel the margin of the craton.

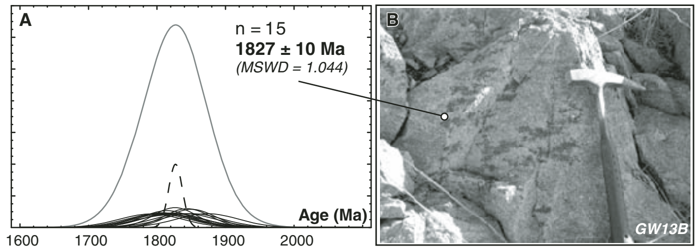

Figure 1. A: Weighted histogram representation of the data for sample GW13B, an isotropic cordierite-bearing granite presented in (B). Each small black bell-shaped curve corresponds to the probability density function for one measurement. Gray curve is the sum of all individual bell-shaped curves. Black dashed curve represents the age calculated by the statistical procedure cited in Duclaux et al. (2007).

Our new structural and geochronological data suggest that the Kimban reactivation is strongly partitioned into the Kalinjala Shear Zone, since the 1850 Ma Donnington suite to the west of the Kalinjala shear zone is undeformed. They also show that a high-grade Neoarchean constrictional fabric exists in the Sleaford Complex.

Overall, we see no incompatibility between the strong Proterozoic reactivation that exists along the eastern margin of the craton and the presence of a pervasive Neoarchean constrictional fabric preserved to the west of the Kalinjala Shear Zone.

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