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Reanalysed Ozone Profiles from Australian Historical Umkehr Data

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Using spectral diurnal variation observations from the ground is the oldest methodology employed to determine the vertical distribution of ozone in our atmosphere. There has been significant recent effort to revisit and reanalyse historical Dobson Umkehr data, for example Miyagawa et al., [2009] for the Japanese sites and Krzyscin and Rajewska-Wiech, [2009] for Belsk in Poland (1963-2007). Globally, Bojkov et al., [2002] examined 15 long-term Umkehr sites, of ∼80 total, including some of the Australian sites presented here. However, the Australian sites were incomplete, with many of the early records not digitized, of particular significance are Brisbane and Perth data records, which extend from the 1960s to present. The profiles retrieved from these Umkehr data represent ozone products that pre-date the satellite era and provide significant climate records. The Australian sites span latitudes from the tropics to the Furious Fifties (50-60oS over the Southern Ocean). Data from six Australian sites are presented: Darwin (12.4oS, 130.8E; 1966-1974, 1990-2001, 2001-present), Brisbane (27.5oS, 153E; 1967-present), Perth (31.9oS, 116.0; 1969-present), Melbourne (38oS, 145.1oE; 1955-2001), Hobart (42.9oS, 147.3oE; 1967-1973, 1974-1992), Macquarie Island (54.5oS, 158.9E). We present the full instrumental records for the six Australian Umkehr sites (including several site and instrumental changes). Ozone profiles are retrieved using the updated methodology of Stone et al., [2015] which takes full advantage of the improved information content achieved when the complete SZA range and all A, C and D wavelength pairs are used.

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