

Interactive comment on “The MIS 11 – MIS 1 analogy, southern European vegetation, atmospheric methane and the “early anthropogenic hypothesis”” by P. C. Tzedakis

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I am grateful to Bill Ruddiman for his insightful comments. He is correct to point out that the MIS 19 CH₄ peak 778 ka is shorter (~1.5 kyr vs. 5 kyr) and of lower amplitude (80 ppbv vs. 150 ppbv) compared to the Holocene CH₄ increase up to pre-industrial times, as indeed noted in the CPD paper. It is entirely possible, therefore, that the 778 ka peak is a millennial-scale feature, not related to orbital changes, something I had not properly considered in the original manuscript.

However, it should be noted that both the MIS 1 and 19 CH₄ peaks occur during precession maxima corresponding to boreal insolation minima. Moreover, apart from the

C750

methane overshoots at the onset of some interglacials, millennial-scale increases in CH₄ concentrations associated with full-interglacial conditions are normally on the order of 30 ppbv. The 80 ppbv increase around 778 ka appears to be outside that range, which in turn raises the question on the nature of a millennial event that would lead to such a change during an interglacial.

Be that as it may, a millennial-scale origin of the CH₄ peak around 778 ka proposed by Bill Ruddiman is a valid point, which should be explored further. Higher-resolution palaeoclimate records of MIS 19 are needed in order to clarify the nature of these changes.

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