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TITLE: High-resolution palaeomagnetic records of the Laschamp geomagnetic excursion from ODP Sites 1061 and 1062

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ABSTRACT BODY: The Laschamp geomagnetic excursion (~41 ka) was a brief global deviation in geomagnetic field behaviour from that expected during normal secular variation. Previously published records suggest rapid changes in field direction and a concurrent substantial decrease in field intensity. We present here high-resolution palaeomagnetic records of the Laschamp excursion obtained from two Ocean Drilling Program (ODP) Sites 1061 and 1062 on the Blake-Bahama Outer Ridge (ODP Leg 172) and compare this record with previously published records of the Blake and Iceland Basin Excursions.

Relatively high sedimentation rates (>10 cm kyr\(^{-1}\)) at these locations allow the determination of transitional field behaviour during the excursion. Rather than assuming a constant sedimentation rate between assigned age tie-points, we employ measurements of \(^{230}\)Th\(_{xs}\) concentration in the sediment to assess variations in the sedimentation rates through the core sections of interest. This allows us to better determine the temporal behaviour of the Laschamp excursion with greater accuracy and known uncertainty. The Laschamp excursion at this location appears to be much shorter in duration than the Blake and Iceland Basin excursions.

Palaeomagnetic measurements of discrete samples from four cores reveal a single excursional feature, across an interval of 30 cm, associated with a broader palaeointensity low. The excursion is characterised by rapid transitions (less than 500 years) between a stable normal polarity and a partially-reversed, polarity.

Peaks in inclination either side of the directional excursion indicate periods of time when the local field is dominated by vertical flux patches. Similar behaviour has been observed in records of the Iceland Basin Excursion from the same region. The palaeointensity record is in good agreement between the two sites. The palaeointensity record shows two minima, where the second dip in intensity is associated with a more limited directional deviation. Similar field intensity behaviour has been observed during the Blake excursion suggesting that the geomagnetic field stability may be reduced for relatively long durations, potentially up to tens of thousands of years.