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# Thellier paleointensity procedure simulation on rocks bearing laboratory induced TCRM

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Paleointensity (PI) determination often face with the risk to misidentify NRM as TRM while in reality the studied rock carries CRM or TCRM. The danger is aggravating by difficulties to distinguish CRM (TCRM) from TRM by any known means including the Thellier procedure. Indeed, as was shown experimentally (Draeger et al., 2006, Gribov et al. 2017), Arai-Nagata diagrams obtained for a laboratory induced CRM exhibit a well-defined straight line segment which can be used for the "ancient" field determination. However, the values obtained by this way always underestimate PI by (1.5-5) times. Some relief circumstance may be that CRM by its definition usually presents a secondary NRM component what can be detected by some other way. But another kind of chemical remanence, TCRM, created at T < Tc of magnetite due to oxidation of titanomagnetite grains during cooling of newly erupted volcanic rocks must be regarded as a primary NRM and its properties were not yet investigated in due measure. Laboratory TCRM was created by quick heating of a sample containing TM grains to 570 C following by very slow cooling in air at rate of 1C/hour in the presence of an external field = 50 $\mu$T. A complex magneto-mineralogical, electron microscopy and X-ray diffractometry studies, performed on different stages of process of cooling have shown that creation of TCRM is associated with the exsolution of highly oxidized titanomaghemites. Importantly, simulation of the Thellier method on these samples led to PI values very close to the true field = 50 $\mu$T. This result radically differs on that of obtained for the CRM and provides a good hope that, contrary to the common fears, TCRM and TRM may be equivalent sources for true paleomagnetic information. The work was supported by the state assignment 17-05-00259 and the RFBR grant 17-05-00259.