New paleo- and rockmagnetic constraints for the Laschamp event in the Chaîne des Puys.

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The discovery by Bonhommet and Babkine (1967) of almost reverse directions of magnetization recorded by the Laschamp and Olby lava flows triggered a wide interest. This was indeed the first significant observation supporting the existence of a short geomagnetic event referred as a geomagnetic excursion. Subsequent studies established that these flows were 30 and 40 kyrs old (Gillot et al, 1979) in coincidence with a period of low dipole field intensity. Thus these anomalous directions could either be due to the emergence of the non dipole field or represent an aborted field reversal. An opposite view was put forward by Heller and Petersen (1982) who argued that, despite synchronism with the dipole collapse, the reversed magnetization of the flows was actually not relevant to the field but rather caused by self-reversal processes. The most recent study by Chauvin and Roperch was a response to this rock magnetic hypothesis and argued in favour of a geomagnetic origin.

During the past twenty years a large number of thermoluminescence (sometimes 14C) dated flows from the Chaîne des Puys provided ages between 30 and 65 ky BP. We used this opportunity to sample many new units in order to clarify the origin of the magnetization and hopefully improve the resolution of the Laschamp event with additional directions and rock magnetic investigations. We sampled 14 flows with ages between 30 and 65 kyrs and measured 203 samples. Alternating field and thermal demagnetizations were performed on twin samples to investigate the stability and the consistency of the components observed. The results obtained so far reveal that only 7 lavas have a stable characteristic component with normal polarity. Surprisingly, no well defined transitional or reverse direction could be isolated. The seven other flows are characterized by very scattered directions which in some cases can be found along a small circle passing across the normal polarity. In many cases the samples exhibit very complex demagnetization behaviour. Thermomagnetic experiments indicate that magnetite dominates the mineralogy of the samples with normal polarity while a titanomagnetite assemblage controls the magnetization of samples that exhibit anomalous components. This correlation between directions and mineralogy is not incompatible with previous observations by Heller and Petersen for the Olby lava flow. We are currently re-investigating the hypothesis of self reversing magnetization by perform-

ing measurements at various temperatures in presence of the field as well as repeated acquisitions of partial thermoremanence with various checks on the residual NRM.