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CONSERVATION, SCANNING AND DIGITIZATION OF HISTORICAL GEOMAGNETIC DATA ARCHIVES FROM BRAZIL

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Abstrac

(。) Results of VGP dispersion parameter (S_{R}) vs. time SB for the period related to Permo-Carboniferous S_B = 10.2° Reversed Superchron (PCRS) NORMAL REVERSED PCRS Discussion Franco et al. (2012)
Derder et al. (2001a)
Brandt et al. (2009) Late Middle Early Guadalupian Cisuralian Merabet et al. (1998) Pennsylvanian Bachtadse et al. (2002 Rapalini et al. (2006) Tomezzoli (2001) Soffel & Harzer (1991) The debate about superchrons in the literature – for instance, about CARBONIFEROUS PERMIAN Rakotosolofo et al. (2006) Pisarevsky et al. (2006) Dominguez et al. (2011a) its onset, relationship between reversal frequency and field strength, · Dominguez et al. (2011) · Yuan et al. (2009) Domeier et al. (2011b Bazhenov et al. (2008) secular variation behavior, theoretical and numerical modelling – is Nawrocki et al. (2008; comp.B) Nawrocki et al. (2008; comp.A) - Meijers et al. (2010) 9 - Liss et al. (2004) highly contendious. As recently summarized by Kruiver et al. (2002), - Opdyke et al. (2001) Age (Ma) different, and even contraditory, model concepts arises from phenomenological geodynamo modelling, aiming to explain the origin of superchrons. - Franco et al. (2012 VGP scatter datasets (45° fixed cut-off) x latitude - Derder et al. (2001a) Northern Hemisphere - Brandt et al. (2009) (A)Noteworthly, it is important to highlight some demonstrative points Merabet et al. (199 Bachtadse et al. (2) PCRS Rapalini et al. (200 about of the still limited knowledge on how superchrons had occurred: Tomezzoli (2001) Southern - Soffel & Harzer (1991 Pre-selected VGP scatter datasets x latitude Hemisphere Rakotosolofo et al. (200 (i) As discussed by Kruiver et al. (2002), paleomagnetic observations Pisarevsky et al. (2006 this work ominguez et al. (2011 have not been able to unequivocally discard either the 'high-' or ominguez et al. (2011 Yuan et al. (2009 **Highlights** Best-fit Model G (McFadden et al. 1988) for the high-quality Group 1 data sets (Cretaceous Normal Superchron deposits; Domeier et al. (2011b) 'low-energy state' models; (ii) besides the discussion on 'low-' and Bazhenov et al. (2 Nawrocki et al. (2008; comp.B)
Nawrocki et al. (2008; comp.A) 'high-energy state' models, it is also advocated that there is no simple - Meijers et al. (2010) Biggin et al., 2008a) 19 - Liss et al. (2004) 20 - Opdyke et al. (2001) relationship between superchrons (e.g. Prévot et al., 1990; Thomas et al., It is well-accepted that a very complex interplay, still far to be fully elucidate, rule over the 1998, 2000), and even any correlation between reversal processes and geodynamic processes between Earth's core, mantle and crust (Eide & Torsvik, 1996). Surely, the EMF's strength had been suggested (Biggin & Thomas, 2003; one of the most fascinating, enigmatic and longest standing set of problems in Earth Sciences, still far to be fully understood, are those related to how the self-sustained geodynamo is kept Garcia et al., 2006); (iii) basically, the most of the phenomenological against ohmic decay along the Earth's evolution (Kuang & Bloxham, 1997; Jackson et al., models were, up to now, formulated for the ~ 118-83 Myr Cretaceous 2000; Christensen & Tilgner 2004). Normal Superchron (CNS); (iv) different tectonic and geodynamic •) conditions were related to the KRS and CNS periods – the KRS In such context, important advances have been achieved by numerical geodynamo modelling corresponds to a continental assemblage episode (during the efforts in the last decades, providing important insights about the Earth's deep interior and amalgamation of Pangea), whereas the CNS post-dates a prolonged surface processes, as well as its relationship with the geodynamo's phenomenology and generation period of supercontinental mantle insulation followed by continental mechanisms. Some illustrative debates are those related to the role of outer core dynamics and break-up (Eide & Torsvik, 1996); (v) it cannot be ruled out that these core-mantle coupling on the triggering of excursions and reversals processes, its timescales and frequencies, as well as on the field strength along geological eras (Loper & McCartney, 1986; models - which were designed aiming to explain the CNS - could not be Larson and Olson, 1991; Glatzmaier et al., 1999; Tarduno et al., 2001; Biggin & Thomas, 2003; compatible to the KRS – and, in such scenario, the geodynamo's state Tauxe, 2006). Notwithstanding, several issues remain unsolved due to a set of factors – ranging might be substantially different between both superchrons. from distinctive modeling approaches (e.g. definitions of boundary conditions, dimensionless parameters, sources of energy) to computational threshold for modelling on a realistic parameter These preliminary results, based on calculations of VGP dispersion regime (Yokoyama & Yamazaki, 2000; Dormy & Le Mouël, 2008; Kageyama et al., 2008) -S Hemisphere N Hemisphere parameters from a pre-selected paleomagnetic data sets, are remarkably which prevents a full understanding of the dynamics of the EMF and the geodynamo. Paleolatitude (°) consistent with the S- λ behavior for the CNS best-fit Model G - which **(B** Most of experimental database which support the modelling efforts traditionally come from Pre-selected VGP scatter datasets x latitude can be particularly verified for the Southern Hemisphere results -, and paleomagnetic research. Since the decade of 1950, substantial information has been provided related are in a good agreement with some studies (e.g., Tarduno et al., 2002; Evaluation of the latitudinal dependence of the palaeosecular variation to the behavior of geomagnetic polarity and paleosecular variation (PSV) through geological time. Haldan et al., 2009) which indicate that the (paleo)secular variation (PSV) by comparison of the best-fit Model G (McFadden et al. 1988) – It has been discussed that PSV may reflect the evolution of the core-mantle boundary (CMB) may tend to be lower during superchrons than for periods of higher within a 95 per cent confidence limit for the high-quality Group 1 data conditions and hence it could be of great importance in providing constraints to geodynamo - Franco et al. (2012) reversing rates (e.g., the 0-5 Myr Jurassic period; Johnson et al., 2008). sets, Cretaceous Normal Superchron deposits, and after using the cut-off numerical models (Heller et al., 2002; Haldan et al., 2009). For instance, geodynamo models (\circ) angle using the method proposed by Vandamme (1994)–and that were based on different thermal conditions to the CMB (e.g., Glatzmaier et al., 1999; Coe & Glatzmaier, omezzoli (2001) Soffel & Harzer (1991) Rakotosolofo et al. (2006) Pisarevsky et al. (2006) Dominguez et al. (2011a) - Dominguez et al. (2011b) - Yuan et al. (2009) - Domeier et al. (2011b) - Bazhenov et al. (2008) 3 - Nawrocki et al. (2008) 3 - Nawrocki et al. (2008; corr 7 - Nawrocki et al. (2008; corr 8 - Meijers et al. (2010) 19 - Liss et al. (2004) 20 - Opdyke et al. (2001) SB 2006) have indicated distinctive patterns of latitudinal dependence of PSV with latitude (Tauxe, Our goal for the upcoming advances on this research is to improve such presented by Biggin et al. (2008a) compared with low (palaeo)latitude Permian data sets related to the Dôme de Barrot and Lodève basins 2008), and some studies (e.g., McFadden et al., 1988; 1991; Hulot & Gallet, 1996; Johnson et al., paleomagnetic database and to provide a best fit for S- λ related to the PCRS. 2008; Biggin et al., 2008b) have pointed out for a possible relationship between virtual (Haldan et al. 2009 – red symbols). Open and dark circles are, geomagnetic pole (VGP) scatter curves and the geomagnetic reversal rate for a given geological respectively, the results from the northern and southern hemispheres) period. and the observed scattering patterns of the pre-selected VGP data sets Acknowledgments by this work. (A) Inter-hemispheric; and (B) superimposed datasets. Paleolatitude (°) CAPES (grant AEX 11852/13-5)

One of the most fundamental questions about geomagnetic polarity reversals is that of stability. It has been suggested that the observed latitudinal dependence for the angular dispersion of paleosecular variation (PSV) and the inferred relationship with the mean geomagnetic reversal rate could be used as a good first-order tool for assessing the stability of geomagnetic field. Geomagnetic 'superchrons' – with single geomagnetic polarity period for $\sim 10^7$ years – are so long they clearly do not represent an ordinary polarity change, but imply a fundamental transition in the dynamo processes. Studies on the PSV behavior throughout these lengthy geomagnetic intervals do represent an outstanding opportunity for providing useful constraints for understanding reversal processes and the geodynamic evolution. In this work, we present our preliminary results from an inter-hemispheric evaluation of the latitudinal and time dependence of the PSV stability through evaluation of scattering pattern of VGP datasets (estimation of dispersion parameter corresponding paleolatitude ($S_{B}-\lambda$)) calculated from pre-selected paleomagnetic datasets for the ~318-262 Myr Permo-Carboniferous Reversed Superchron (PCRS).

PRELIMINARY RESULTS OF THE LATITUDINAL AND TIME DEPENDENCE OF PALEOSECULAR VARIATION DISPERSION PARAMETER DURING THE KIAMAN SUPERCHRON (318-262 Ma): AN INTER-HEMISPHERIC APPROACH

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