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Asian paleoenvironments, paleogeography and paleobiodiversity interactions during the Greenhouse-Icehouse transition

Guillaume Dupont-Nivet^{1,2}, Niels Meijer¹, Mustafa Kaya¹, Jan Westerweel², Delphine Tardif³, Natasha Barbolini⁴, Alexander Rohrmann¹, Jovid Aminov⁵, Diego Ruiz¹, Amber Woutersen⁴, Huansheng Huang⁴, Fernando Poblete⁶, Alexis Licht⁷, Pierrick Roperch², Carina Hoorn⁴, Jean-Noël Proust², Frederic Fluteau³, Yannick Donnadieu⁸, and Stéphane Guillot⁹

¹CNRS - Potsdam University, Institute of Geosciences, Potsdam - Golm, Germany (guillaume.dupont-nivet@univ-rennes1.fr)

²CNRS - Geosciences Rennes, Univ Rennes, France

³Institut de Physique du Globe de Paris, Paris, France

⁴Department of Ecosystem & Landscape Dynamics, Institute for Biodiversity & Ecosystem Dynamics (IBED), University of Amsterdam, The Netherlands

⁵Institute of geology, earthquake engineering and seismology, Academy of Sciences of the Republic of Tajikistan

⁶Instituto de Ciencias de la Ingeniería, Universidad de O'Higgins, Rancagua, Chile

⁷Dept. Earth and Space Sciences, University of Washington, Seattle, United States

⁸Centre Européen de Recherche et d'Enseignement de Géosciences de l'Environnement, CEREGE - Aix-Marseille Univ, Aix en Provence, France

⁹Institut des Sciences de la Terre, Université Grenoble Alpes, France

The ongoing surge of international research on Asian Climate and Tectonics enables to better assess interactions between forcing mechanisms (global climate, India-Asia collision, Tibetan Plateau growth) and paleoenvironmental changes (monsoons, aridification), land-sea distribution, surface processes, paleobiogeographic evolution and the global carbon cycle. We review here the progress of the ERC MAGIC project (Monsoons in Asia caused Greenhouse to Icehouse Change?) integrating regional geodynamic constraints, well-dated environmental / biodiversity records and climate modeling. MAGIC focuses on the Paleogene period that includes the global Greenhouse to Icehouse cooling, the early collision and plateau growth and associated regional development of monsoons and westerlies over the Proto-Paratethys sea. Our work focuses on three areas constraining Asian paleoenvironments. (1) In Myanmar, paleomagnetic results, new dating of magmatic rocks and sediments along with additional detrital geochronology and basin analysis of the Burmese subduction margin and implications for the history of India-Asia convergence. (2) Along the Northeastern Tibetan Plateau margin, the combination of multiple proxies (leaf wax stable isotope, pollen, grain size, etc...) applied to an extended lacustrine Paleogene record enables to identify precisely Asian climate changes and their consequences on ecosystems. (3) In westernmost China and Tajikistan, the proto-Paratethys sea fluctuations and the sedimentary records of Pamir tectonic evolution are now precisely dated enabling to constrain driving mechanisms and paleoenvironmental consequences. Together these results are used to constrain climate modeling experiments which permit validation of hypotheses on interactions between

paleogeography, paleoenvironments and paleobiodiversity at Asian and global scales in response to long-term and short-term events.