Geophysical Research Abstracts, Vol. 7, 10386, 2005
SRef-ID: 1607-7962/gra/EGU05-A-10386

STRUCTURAL CONTROL ON HYDROCARBON-RICH FLUID VENTING IN THE GULF OF CADIZ: NEW INSIGHTS FROM THE TTR-14 AND MATESPRO CRUISES

L.M. Pinheiro (1,2), M. Comas (3), V. Magalhães (1,2), A. Carvalho (1), J. Moedas (3), B. Aguado (1), L. Somoza (4) , J. Gardner (5) and M. Ivanov (6)

(1) Dep. Geociências, Universidade de Aveiro, 3800-193, Aveiro, Portugal, (2) Dep. de Geologia Marinha, INETInovação, Alfragide, Portugal, (3)Dep. Geologia, Fac. Ciências, Universidade de Lisboa, Portugal, (4)Div. Geologia Marina, Instituto Geologico y Minero, Madrid, España, (5)Naval Research Laboratory, Washington DC, USA, (6)UNESCO Center for Marine Geology and Geophysics, Moscow State University, Geology Faculty, Russia. (lmp@geo.ua.pt Fax: +351 234 370 605 Phone:+351 234 370 757)

The Gulf of Cadiz is characterized by extensive hydrocarbon-rich fluid seepage revealed by numerous mud volcanoes, mud diapiric ridges, pockmarks, gas-related authigenic carbonate crusts and chimneys. Gas hydrates have been recovered from 3 of the 30 mud volcanoes confirmed by gravity coring in this area. The composition of the gases from the gas hydrates indicates a thermogenic origin that suggests the possible existence of oil basins at depth. The study area is seismically active, because it situated close to the Açores-Gibraltar Plate Boundary. Focal mechanism solutions indicate a combination of dextral strike-slip movement and compressional tectonics related to the Africa-Eurasia NW-directed convergence. An integrated interpretation of side-scan imagery (both surface and deep-towed), multibeam bathymetry and seismic reflection profiles (both high-resolution single channel and multichannel), particularly with the recently acquired data during the TTR-14 and the MATESPRO cruises allows a more detailed interpretation of the structural control in the fluid seepage in this area. Many of the mud volcanoes seem to be located at fault intersections, while major diapiric ridges occur along major NE-SW and SW-SE trending conjugate sets of strike-slip faults. The whole area of fluid seepage is controlled by very deep structures, as shown on several deep multichannel seismic profiles.

This work was supported by the MVSEIS Euromargins Collaborative Research Project (01-LEC_EMA24F; PDCTM72003/DIV/40018-MVSEIS).