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Kimberly A. Ilao, Christopher K. Morley, Mario A. Aurelio

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3D seismic investigation of the structural and stratigraphic characteristics of the Pagasa Wedge, Southwest Palawan Basin, Philippines, and their tectonic implications

Kimberly A. Ilao[a] , Christopher K. Morley[a,*] and Mario A. Aurelio[b]

[*]Corresponding author, E-mail address: chrissmorley@gmail.com (C.K. Morley)

[a]Petroleum Geophysics MSc Program, Department of Geological Sciences, Chiang Mai University, Chiang Mai, Thailand

[b]Structural Geology and Tectonics Laboratory, National Institute of Geological Sciences, University of the Philippines, Diliman, Quezon City, Philippines

Abstract

The Pagasa Wedge is a poorly imaged deepwater orogenic wedge that has been variously interpreted as representing an accretionary prism, a former accretionary prism modified by thrusting onto a thinned continental margin, and a gravity-driven fold-thrust belt. This study, using 2D and 3D seismic data, together with well information indicates that at least the external part of the wedge is dominantly composed of mass transport complexes, capped by syn-kinematic sediments that have thrusts and normal faults superimposed upon them. Drilling shows that despite stratigraphic repetition of Eocene Middle Miocene units, there is stratigraphic omission of Oligocene and Early Miocene units. This absence suggests that mass transport processes have introduced the Eocene section into the wedge rather than thrusting. The accretionary prism stage (Oligocene) of the Central Palawan Ophiolite history appears to be marked by predominantly north-vergent deformation. The Deep Regional Unconformity (~17 Ma) likely indicates the approximate time when obduction ceased in Palawan. The Pagasa Wedge is a late-stage product of the convergence history that was