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Morphology and Geologic Implications of Penghu Channel off southwest Taiwan

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ABSTRACT

Penghu Channel shows submarine valley morphology characterized by relatively shallow and wide elongate depression with gently sloping sides and a continuous bottom gradient. The possibility of being a river valley of the Penghu Channel during Late Pleistocene can not be ruled out. But, modern currents completely overprint the signature of inherited paleo-geomorphology of a river valley. At present, Penghu Channel is considered as a scour furrow of probably erosion origin, mainly by northward tidal currents. It serves as a sediment pathway transporting shelf sediment alongshore and northward on the tide-dominated Taiwan Strait shelf. Penghu channel together with Yunchang Ridge to the north may be considered parts of a modern tidal erosion and deposition system.

Bathymetric data indicate that Penghu Channel may not extend seaward into Penghu Canyon. The head and main course of Penghu Canyon are not aligned with Penghu Channel. They are two different undersea features, not a continuous sea valley. The hypothesis of an ancient Minchiang River flowing from China and extending southward to the sea through a sinuous valley on the exposed Taiwan Strait during Late Pleistocene is not supported by evidence of newly generated bathymetric chart and modern hydrodynamics.

(Key words: Penghu channel, Morphology, Currents, Sediment pathway)

1. INTRODUCTION

1.1 Geological Setting

The island of Taiwan is situated at the junction of the Ryukyu and Luzon Arcs along the

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