MGL0812 MCS Processing
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The pre-stack processing sequence for the 2D seismic lines includes geometry definition, minimum phase band-pass filter, spherical divergence correction and amplitude balancing, F-k filtering, data editing, resampling to 4 ms (with anti-aliasing filter applied) and mute below the first water multiple (see Table). The stacking sequence includes velocity analysis, normal-move out (NMO) and stacking. Velocity analysis for the AML is conducted using semblance and examination of constant velocity stacks, we find that the AML throughout the region is well imaged with a stacking velocity of 2500±50 m/s except for the region within the 9º03'N OSC where a higher stacking velocity (2600 m/s) is required. Results from this analysis are used to modify RMS velocities derived from the ESP5 velocity function [*Vera et al.,* 1990] to create a 2D velocity function, which is hung from the seafloor and used for stacking the seafloor and AML. Optimal stacking velocities for the layer 2a event are determined from evaluation of constant velocity stacks for a range of velocities from 1530 to 1700 m/s and using the mid-offsets of the streamer of 1500-3000 m. Layer 2a is best stacked using velocities of 1580 m/s for the region south of the OSC 9º03'N, and 1560 m/s for north of the OSC. Higher velocities of 1680 m/s are required to stack the event within the OSC region. Section that is stacked with the above velocities is hereinafter referred to as the layer 2a section. The post-stack processing sequence includes 2D Kirchhoff time migration, applied to both sections (the AML and layer 2a) separately. Migration velocities used for the AML sections are 80% of the modified 2D ESP5 function. For migration of the layer 2a sections, water velocity is used that most efficiently collapsed seafloor diffractions. After migrating layer 2a we apply a surgical mute to extract the event and merge it with the AML section to obtain the final seismic image. All the above processing steps are conducted using *Paradigm's* processing suite *Focus*.

References

Vera, E.E., J.C. Mutter, P. Buhl, J.A. Orcutt, A.J. Harding, M.E. Kappus, R.S. Detrick, and T.M. Brocher, 1990, The structure of 0- to 0.2-m.y.-old oceanic crust at 9 degrees N on the East Pacific Rise from expanded spread profiles, Journal of Geophysical Research, vol. 95, Issue B10, pp. 15,529-15,556.

Table 1

Processing sequence	2D line (CBL#2)
Geometry definition	2D geometry
Editing	
Pre-stack	1. Band-pass filtering (2-7-220-250 Hz) 2. Spherical divergence correction 3. Surface consistent amplitude correction 4. Resampling to 4 ms (with applied anti-aliasing filter) and 8 [s] trace length 5. F-k filter and edits applied 6. Mute right above the first water multiple
Stacking	7.Defining stacking velocity 8. NMO and stacking
Post-stack	9a. For layer 2a: 2D Kirchhoff post-stack time migration using water velocity 9b. For AMC: 2D Kirchhoff post-stack time migration using ~ 80% of the ESP5 velocity function
Display	10. Top mute above the seafloor 11. Apply surgical mute to the layer 2a section and merge it with the AMC section 12. Scaling composite seismic section