



Figure 2: Location map of the Izu-Bonin-Mariana (IBM) arc-trench system. IBM forms the convergent margin between the Pacific and Philippine Sea plates. Backarc basins such as Shikoku Basin, Parece Vela Basin, and Mariana Trough were created by seafloor spreading between the formerly contiguous remnant arc (Kyushu-Palau and West Mariana ridges) and the active IBM arc. In the north, the IBM arc has collided with the Honshu since 15 Ma. The X-X' red line locates the structural model cross sections below. Numbers show proposed drill sites. Lower panels show seismic structure of the crust and upper mantle based on seismic refraction and wide-angle reflection data along X-X'. The arc crust seismic structure is explained by the distribution of upper, middle, and lower crust layer as schematically shown in the lower panel. IBM is the only juvenile intra-oceanic arc known to have a well-developed, low-velocity middle crust with $V_p=6.0-6.3$ km/s, possibly of similar composition to the average continental crust. Figure modified from Tatsumi and Stern (in press)