Imbricate stack composed mainly of basalts and chert in the Jurassic accretionary complex of the Takayama area, Gifu Prefecture

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Jurassic accretionary complex of the Mino Belt in the Takayama area, central Japan includes the unit characterized by a vast amount of slabs of basalts and chert. The unit shows an imbricate structure, which is represented as the repetition of the sequence composed of clastic rocks (mudstone, sandstone and felsic tuff), Toishi-type siliceous claystone (Imoto, 1984), chert, limestone and basalts. Each slab trends east-northeast and dips steeply north. Most of the slabs are in fault contact with each others. Specifically, the shear zones preferably run along the basalts, siliceous claystone and clastic rocks. Deformation structure in this unit suggests that phyllosilicate-rich parts within the accreted rocks are preferably weakened due to diffusive mass transfer and cataclasis accommodated deformation.

The shear zones in the basalts and siliceous claystone indicate top-to-the-east displacement. After the correction of folding, tilting and rotating by the method from Kimura (1999), the shear direction shows dextral strike-slip along the Jurassic-Cretaceous East Asian plate convergence (northeast trending). On the other hand, the shear zones in the clastic rocks indicate top-to-the-west displacement. Asymmetrical mesoscopic folds developed in chert also show the same shear direction as the shear zones in the clastic rocks. After the correction, the top-to-the-west displacement shows that the hanging wall is thrust southeastward over the plate convergence.

On the basis of the kinematical study in the Takayama area, one model is proposed that the Paleo-Pacific plate moved westward and dextral obliquely subducted into the East Asian plate convergence. Due to the oblique subduction, slip vectors were possibly partitioned into the trench-orthogonal and trench-parallel components. The siliceous claystone and basalts related to the trench-parallel shearing correspond to the lower part of the oceanic plate stratigraphy (Isozaki et al., 1990). The kinematical structure is consistent the fact that the trench-parallel shearing occurred in the deeper part of the accreted plate contemporaneously with the continued trench-orthogonal shearing in the shallower part (e.g. Davis et al., 1998).