五、风火山活动断裂

风火山活动断裂由风火山北麓斜滑断裂、风火山活动断裂、二道沟拉分盆地和二道沟盆缘活动断裂组成（吴章明等，1993；吴珍汉等，2003c）。沿主要活动断裂发育断层陡坎、线性分布泉水群和串珠状冰丘群，左旋错断冲沟、山脊和冲洪积扇，切割晚更新世—全新世砂砾石层。风火山北麓断裂（F_{24}）7.65ka 以来的平均左旋走滑运动速度为 4.3mm/a，22.1ka 以来的平均左旋走滑运动速率为 4.07mm/a，说明风火山北麓活动断裂全新世运动速率比较稳定。二道沟盆北断裂（$F_{26\text{-}4}$）16.3ka 以来平均左旋走滑运动速度为 1.10mm/a，二道沟盆南断裂（F_{27}、$F_{27\text{-}1}$、$F_{27\text{-}8}$）晚更新世晚期—全新世平均左旋走滑运动速度分别为 3.52mm/a、2.98mm/a 和 0.51mm/a，二道沟盆缘断裂（$F_{26\text{-}6}$、F_{27}、$F_{27\text{-}1}$、$F_{27\text{-}8}$）尚具有 0.12-0.51mm/a 的垂直速度分量。

PART 5 FENGHUOSHAN ACTIVE FAULT

The Fenghuoshan active fault system is consisted of north Fenghuoshan oblique-slip fault, Fenghuoshan active fault, Erdaogou pull-apart basin and its boundary faults (Wu et al., 1993, 2003c). These faults cut Late Pleistocene-Holocene sands and pebbles (Wu et al., 2005). Along major active faults formed fault cliffs, linear distributed springs and pingos and sinistral slipped streams, ridges and alluvial and fluvial fans. Average sinistral strike-slip rate of north Fenghuoshan fault (F_{24}) is 4.3mm/a since ~7.65kaB.P. and 4.07mm/a since 22.1ka. Average sinistral strike-slip rate of north boundary fault of Erdaogou basin ($F_{26\text{-}4}$) is 1.10mm/a since 16.3 kaB.P. And average slip rate of south boundary faults of Erdaogou basin F_{27}, $F_{27\text{-}1}$, $F_{27\text{-}8}$ is 3.52mm/a, 2.98mm/a, 0.51mm/a respectively in Late Pleistocene-Holocene with vertical component of 0.12~0.51mm/a.



图 49 风火山北活动断裂陡坎

断裂 F_{24} 左旋错断冲沟 33m，切割最新沉积物的光释光年龄为 7.65±0.65ka，断裂左旋走滑平均运动速率为 4.3mm/；镜头向东，摄于 2004 年 7 月。

Fig.49 View eastward in July of 2004 at 33m sinistral offset of gully and terrace with OSL age of 7.65±0.65ka along north Fenghuoshan fault F_{24}, indicating average sinistral slip rate of 4.3mm/a



图 50 风火山北活动断裂温泉水坑

铁路大桥横穿活动断裂，在桥西沿 F_{24} 断裂破碎带发育低温温泉，形成泉水坑；镜头向东，摄于 2004 年 3 月。

Fig.50 View eastward at low-temperature spring pond along north Fenghuoshan fault (F_{24}) in March of 2004 in west of the Golmud-Lhasa Railway



图 51 风火山北活动断裂冬季发育的冰丘群

铁路西侧沿活动断裂发育冰丘群，最大冰丘直径 62m，高 1.8m；镜头向东，摄于 2004 年 3

月。

Fig.51 View eastward in March of 2004 at pingos formed in North Fenghuoshan fault (F_{24}) with the largest pingo of 1.8m high and 62m in diameter



图 52 二道沟盆北边界断裂陡坎

断裂切割上白垩统红层，错断现代冲沟，形成高 5-6m 的断层崖；镜头向北，摄于 2002 年 2 月。

Fig.52 View northward in February of 2002 at 5-6m high scarp of north boundary fault ($F_{26\text{-}4}$) of Erdaogou basin



图 53 二道沟盆北边界断裂探槽剖面

（断裂切割晚更新世砂砾石与灰绿色坡积物及全新世砂土，镜头向西，摄于 2004 年 7 月）

Fig.53 View westward at trench perpendicular to north boundary fault ($F_{26\text{-}4}$) cutting Late Pleistocene pebbles and Holocene sandy soil of Erdaogou basin in July of 2004



图 54 二道沟盆北边界断裂剖面结构

（断裂切割晚更新世砂砾石和灰绿色坡积物及全新世紫红色砂土，镜头向西，摄于 2004 年 7 月）

Fig.54 View westward in July of 2004 at north boundary fault of Erdaogou basin cutting Holocene sandy soil



图 55 二道沟盆西边界断裂（$F_{26\text{-}6}$）左旋错断冲沟 10m

（镜头向南东，摄于 2002 年 2 月）

Fig.55 View southeastward in February of 2002 at 10m sinistral offset of stream along west boundary fault (F_{26-6}) of Erdaogou basin



图 56 二道沟盆地北东端断裂破碎带

断裂切割上白垩统紫红色砂砾岩，形成右片理、断层角砾岩与断层泥组成的断裂破碎带；镜头方向 110°，摄于 2002 年 6 月。

Fig.56 View east southeastward in June of 2002 at cleavage and breccia of northeast boundary fault of Erdaogou basin



图 57 二道沟盆南边界断裂 (F_{27}) 左旋错断冲沟 54m

断裂切割最新冲积物热释光年龄为 15.3±1.2ka，左旋走滑运动速率为 3.52mm/a；镜头向南，摄于 2002 年 2

月

Fig.57 View southward in February of 2002 at 54m sinistral strike-slip of stream along boundary fault (F_{27}) of Erdaogou basin cutting alluvial deposits of 15.3±1.2ka, showing average slip rate of 3.52mm/a