**Table 2: Scaling relations between parent faults and tip splay networks**

**Table 2, Perrin et al.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fault No.** | **Fault Name** | **Fault slip mode** | **Fault length (or width in a few cases) (km)** | **Length of the tip splay network (km)** | **Map-view\* width of the tip splay network (km)** | **Maximum angle of the splay faults to the parent fault (°)** | **Mean angle of the splay faults to the parent fault (°)** | **References** |
| 1 | Alligerville fault | SS LL | 0,044 | 0,021 | 0,0025 | ~7 (for most recent generation) | ~7 | Vermilye and Scholz, 1998 (Fig. 8) |
| 2 | Altyn Tagh fault | SS LL | 2000 | 740 | 210 | 50 | 30 | Meyer et al., 1998 (Fig.1) |
| 3 | Analogue faults | N | ~0.0001 | Left: 0.000035  Right: 0.000056 | 0.000008  0.00001 | ~5  ~25 | ?  ? | Mansfield and Cartwright, 2001 (Fig. 11f-g) |
| 4 | Bogd fault | SS LL  & RE | ~430 | ~240 | ~75 | ~35 | ~20 | Tapponnier and Molnar, 1979 (Fig. 6) |
| 5 | Bolfin fault | SS LL | > 19 | > 9 | ~4.6 | ~55 | ~25 | Cembrano et al., 2005 (Fig.3) |
| 6 | Camp Rock-Emerson fault zone (including Homestead and Johnson Valley faults) | SS RL | ~95 | ~50 | ~20 | ~35 | ~20 | Jachens et al., 2002 (Fig. 1) |
| 7 | Cape Egmont fault | N | ~70 | ~38 | ~17 | ~45 | ~20 | Nicol et al., 2005 (Fig. 3a) |
| 8 | Cheliff fault | RE | ~91 (Boudiaf et al., 1998) | ~25 | ~13 | ~35 | ~35 | Yielding et al., 1989 (Fig.1b) |
| 9 | Chelungpu fault | RE | ~80 | 10 to 37 (unclear) | 7 to 17 | ~ 45 | ~35 | Dominguez et al., 2003 (Fig. 5a) |
| 10  11  12 | David’s Way faults, observed in cross-section along fault width | N | W1  ~ 0.0046 (Fig.1a)  W2 ~0.0008 (Fig. 1b)  W3 ~0.0065 (Fig. 1c) | 0.0012 (same for up and down)  0.00024  0.0011 | 0.0005 (same for up & down)  0.00017  0.0004 | 35  50  55 | 15  35  35 | McGrath and Davison, 1995 (Fig. 1) |
| 13 | Denali fault | SS RL | ~2300 | West: ~800  East: ~580 | West: ~100  East: ~200 | West: ?  East: ? | West: ~20  East: ~30 | Plafker and Berg, 1994 (Fig. 5H) |
| 14 | Dixie Valley fault | N | ~80 | South: ~20 (unclear because mixing with Fairview Peak splays) | South: ~13 | South: ? | South: ? | Bell and Katzer, 1990 (Fig. 1a) |
| 15 | Elsinore fault | SS RL | ~350 | 70 to 120 | 22 to 60 | ~30 | ~20 | Dorsey et al., 2012 (Fig. 1) |
| 16 | Experimental fault at stage 1 | SS LL | 0.000018 | Up: 0.000006  Down: 0.000007 | Up: 0.000001  Down: 0.0000028 | ~90?  ~90? | ~10  ~10 | Otsuki and Dilov, 2005 (Fig. 4a) |
| 17 | Experimental fault (same than above) at stage 2 | SS LL | 0.000030 | 0.000012 | 0.0000032 | ~80 | ~10 | Otsuki and Dilov, 2005 (Fig. 4b) |
| 18 | Gaggade fault | N | ~80 | ~43 | ~12 | ~75 | ~20 | Manighetti et al., 2001 (Fig. 11) |
| 19 | Garze-Yushu fault | SS LL | ~410 | ~230 | 60 | ? | ~15 | Wang et al., 2008 (Fig. 2) |
| 20 | Glacier Lakes fault | SS LL | ~10 | ~4.7 | ~1.4 | ~60 | ~39 | Kirkpatrick et al., 2008 (Fig. 2) |
| 21 | Gozo Island fault | SS LL | 0.008 | 0.001 | 0.0003 | ~80 | 40-50 | Kim et al., 2003 (Fig. 4b) |
| 22 | Iron Ridge fault | N | ~8 | ~2 | ~1 | ~35 | ~10 | Ferrill et al., 1999 (Fig. 3c) |
| 23 | J fault, Levant Basin | N | ~13 | ~5.3 | ~1.2 | ~55 | ~25 | Baudon and Cartwright, 2008 (Fig. 6a) |
| 24 | Kunlun fault | SS LL | ~1500 | Western: ~230 (minimum length as Manyi fault may be a splay)  Eastern: ~450 | Western: ~120 (minimum width as Manyi fault may be a splay)  Eastern: ~210 | Western: ~30  Eastern: ~40 | Western: ~30  Eastern: ~25 | Van der Woerd et al., 2002 (Fig. 1)  Kirby et al., 2007 (Fig. 1) |
| 25 | Lavic Lake-Bullion-Mesquite fault zone | SS RL | ~90 | ~40 | ~12  (Simons et al., 2002) | ~20 | ~20 | Jachens et al., 2002 (Fig. 1) |
| 26 | Longmen Shan fault zone | RE  & RL | ~480 | ~210 | ~26 | ? | ~10 | Shen et al., 2009 (Fig. 1) |
| 27 | Makarrasou fault | N | ~23 | ~10 | ~6 | ? | ~35 | Manighetti et al., 1998 (Plate 1) |
| 28 | Millbrook Cliff fault | SS RL | ~0.0007 | ~0.00013 | ~0.000013 | 25 | 25 | Vermilye and Scholz, 1998 (Fig. 4) |
| 29 | Mont-Lozère fault | SS LL | 0.033 | W: ~0.0073  E: ~0.0065 | W: ~0.004  E: ~0.003 | W: ~55  E: ~ 45 | W: ~ 40  E: ~ 40 | Granier, 1985 (Fig. 12a, bottom fault) |
| 30 | No name fault | SS LL | 0.017 | SW: 0.0077  NE: 0.0056 | SW: 0.0005  NE: 0.0008 | Unclear  ? | Unclear  ~40 | Lim et al., 1998 in Willson et al., 2007 (Fig. 8a) |
| 31 | North Anatolian fault | SS RL | ~1400 | ~490 | ~150 | ~50 | ~15 | Sengör et al., 2005 (Fig. 2) |
| 32 | Pleasant Valley fault system | N | ~70 | North: ~19  South: ~25 | North: ~8  South: ~15 | North: ~45  South: ~35 | North: ~45  South: ~35 | USGS interactive fault map (http://earthquake.usgs.gov/hazards/qfaults/map) |
| 33 | San Andreas fault | SS RL | ~1300 | ~275 | ~90 | ~40 | ~15 | USGS interactive fault map (http://earthquake.usgs.gov/hazards/qfaults/map) |
| 34 | San Jacinto fault | SS RL | ~250 | ~100 | ~15 | ~35 | ~15 | Dorsey, 2002 (Fig. 1) (see also Dorsey et al., 2012) |
| 35 | San Sebastiano-Marsicano fault | N | ~40 | ~20 | ~12 | ~55 | ~35 | Benedetti et al., 2013 (Fig. 2b) |
| 36 | Solitario Canyon fault | N | ~13 | ~4.4 | ~1.2 | ~65 | ~20 | Ferrill et al., 1999 (Fig. 3c) |
| 37 | Solitario Canyon-Iron Ridge fault system | N | ~16 | ~8 | ~2.5 | ~65 | ~15 | Ferrill et al., 1999 (Fig. 3c) |
| 38 | South Alkyonides fault | N | ~46 | ~27 | ~8.5 | ~35 | ~20 | Morewood and Roberts, 1999 (Fig. 3) |
| 39 | South Oquirrh Mountains fault | N | ~25 | South: ~10 | South: ~3.5 | ~20 | ~20 | Wu and Bruhn, 1994 (Fig. 2) |
| 40 | Strathspey-Brent-Statfjord fault | N | > 62 | ~15.6 | ~7 | ~50 | ~20 | McLeod et al., 2000 (Fig. 7) |
| 41 | Taupo rift fault #7 | N | ~6.3 | ~1.6 | ~0.54 | ? | ~15 | Nicol et al., 2010 (Fig. 4, faults 7+6) |
| 42 | Thousand Springs-Warm Springs fault | N | ~35 | ~14 | ~7 | ~45 | ~30 | Crone and Haller, 1991 (Fig. 2) |
| 43 | Unamed fault, Bishop Tuffs | N | ~7 | ~2.4 | ~1 | ~25 | ~20 | Dawers and Anders, 1995 (Fig. 4) |
| 44 | Unamed fault 1, Waterpocket monocline | N  (observed along width) | Width: 0.094 | ~0.02 | ~0.017 | ~50 | ~20 | Davatzes and Aydin, 2003 (fig.6a) |
| 45 | Unamed fault 2, Waterpocket monocline | N | >1.5 | ~0.75 | ~0.3 | ~35 | ~25 | Davatzes and Aydin 2003 (fig.6d) |
| 46 | Velino-Magnola fault | N | ~45 | ~22 | ~11 | ~50 | ~20 | Schlagenhauf et al., 2011 (Fig.1) |
| 47 | Villefort fault | SS LL | ~70 | ~37 | ~15 | ~65 | ~30 | Granier, 1985 (Fig. 1) |

*\* Wsp is measured in map view in 91 % of the fault cases, otherwise in the vertical plane*

**Table 2 :** Scaling relations between parent faults and tip splay networks. Fault numbers refer to numbers in Table 1 and Fig. ES I. The original figures on which the measurements were done are indicated in the last column of the Table, whereas the complete list of references is provided at the end of the Table. Measurements are done as explained in Fig. 1. Fault slip modes as in Table 1. The width of tip splay networks is measured in map view for 91% of the faults, and in the vertical plane for the remaining 9 % of the faults.

**References from Table 2**

Baudon, C., and Cartwright, J., 2008. The kinematics of reactivation of normal faults using high resolution throw mapping. J. Struct. Geol., 30(8), 1072–1084.

Bell, J. W., and Katzer, T., 1990. Timing of late Quaternary faulting in the 1954 Dixie Valley earthquake area, central Nevada. Geology, 18(7), 622–625.

Benedetti, L., Manighetti, I., Gaudemer, Y., Finkel, R., Malavieille, J., Pou, K., Arnold, M., Aumaître, G., Bourlès, D. and Keddadouche, K., 2013. Earthquake synchrony and clustering on Fucino faults (Central Italy) as revealed from in situ 36Cl exposure dating. J. Geoph. Res., 118(9), 4948–4974.

Boudiaf, A., Ritz, J. F., and Philip, H., 1998. Drainage diversions as evidence of propagating active faults: example of the El Asnam and Thenia faults, Algeria. Terra Nova-Oxford, 10(5), 236–244.

Cembrano, J., González, G., Arancibia, G., Ahumada, I., Olivares, V., and Herrera, V., 2005. Fault zone development and strain partitioning in an extensional strike-slip duplex: A case study from the Mesozoic Atacama fault system, Northern Chile. Tectonophysics, 400(1), 105–125.

Crone, A. J., and Haller, K. M., 1991. Segmentation and the coseismic behavior of Basin and Range normal faults: examples from east-central Idaho and southwestern Montana, USA. J. Struct. Geol., 13(2), 151–164.

Davatzes, N. C., and Aydin, A., 2003. The formation of conjugate normal fault systems in folded sandstone by sequential jointing and shearing, Waterpocket monocline, Utah. J. Geophys. Res., 108(B10), p. ETG7. 1-ETG7. 15.

Dawers, N. H., and Anders, M. H., 1995. Displacement-length scaling and fault linkage. J. Struct. Geol., 17(5), 607–614.

Dominguez, S., Avouac, J. P., and Michel, R., 2003. Horizontal coseismic deformation of the 1999 Chi‐Chi earthquake measured from SPOT satellite images: Implications for the seismic cycle along the western foothills of central Taiwan. J. Geoph. Res., 108(B2), p. ESE8.1-ESE8.19.

Dorsey, R. J., 2002. Stratigraphic record of Pleistocene initiation and slip on the Coyote Creek fault, lower Coyote Creek, southern California. Special Papers-Geol. Soc. Am., 251–270.

Dorsey, R. J., Axen, G. J., Peryam, T. C., and Kairouz, M. E., 2012. Initiation of the southern Elsinore fault at∼ 1.2 Ma: evidence from the Fish Creek–Vallecito Basin, southern California. Tectonics, 31(2), p. TC2006.1-TC2006.21.

Ferrill, D. A., Stamatakos, J. A., and Sims, D., 1999. Normal fault corrugation: Implications for growth and seismicity of active normal faults. J. Struct. Geol., 21(8), 1027–1038.

Granier, T., 1985. Origin, damping, and pattern of development of faults in granite. Tectonics, 4(7), 721–737.

Jachens, R. C., Langenheim, V. E., and Matti, J. C., 2002. Relationship of the 1999 Hector Mine and 1992 Landers fault ruptures to offsets on Neogene faults and distribution of late Cenozoic basins in the Eastern California Shear Zone. Bull. Seism. Soc. Am., 92(4), 1592–1605.

Kim, Y. S., Peacock, D. C. P., and Sanderson, D. J., 2003. Mesoscale strike-slip faults and damage zones at Marsalforn, Gozo Island, Malta. J. Struct. Geol., 25(5), 793–812.

Kirby, E., Harkins, N., Wang, E., Shi, X., Fan, C., and Burbank, D., 2007. Slip rate gradients along the eastern Kunlun fault. Tectonics, 26(2), p. TC2010.1-TC2010.16.

Kirkpatrick, J. D., Shipton, Z. K., Evans, J. P., Micklethwaite, S., Lim, S. J., and McKillop, P., 2008. Strike‐slip fault terminations at seismogenic depths: The structure and kinematics of the Glacier Lakes fault, Sierra Nevada United States. J. Geoph. Res., 113(B4).

Lim, 1998. Small strike slip faults in granitic rock: implications for threedimensional models, Masters Thesis, Utah State University, Logan, Utah. 136pp.

McGrath, A. G., and Davison, I., 1995. Damage zone geometry around fault tips. J. Struct. Geol., 17(7), 1011–1024.

McLeod, A. E., N. H. Dawers, and J. R. Underhill, 2000. The propagation and linkage of normal faults: insights from the Strathspey-Brent-Statfjord fault array, northern North Sea, Basin Research, 12, 263–284.

Manighetti, I., Tapponnier, P., Gillot, P. Y., Jacques, E., Courtillot, V., Armijo, R., Ruegg, J.C. and King, G., 1998. Propagation of rifting along the Arabia‐Somalia plate boundary: Into Afar. J. Geoph. Res., 103(B3), 4947–4974.

Manighetti, I., Tapponnier, P., Courtillot, V., Gallet, Y., Jacques, E., and Gillot, P. Y., 2001. Strain transfer between disconnected, propagating rifts in Afar. J. Geoph. Res., 106(B7), 13613–13665.

Mansfield, C., and Cartwright, J., 2001. Fault growth by linkage: observations and implications from analogue models. J. Struct. Geol., 23(5), 745–763.

Meyer, B., Tapponnier, P., Bourjot, L., Metivier, F., Gaudemer, Y., Peltzer, G., Shunmin, G. and Zhitai, C., 1998. Crustal thickening in Gansu-Qinghai, lithospheric mantle subduction, and oblique, strike-slip controlled growth of the Tibet plateau. Geoph. J. Int., 135(1), 1–47.

Morewood, N. C., and Roberts, G. P., 1999. Lateral propagation of the surface trace of the South Alkyonides normal fault segment, central Greece: its impact on models of fault growth and displacement–length relationships. J. Struct. Geol., 21(6), 635–652.

Nicol, A., Walsh, J., Berryman, K., and Nodder, S., 2005. Growth of a normal fault by the accumulation of slip over millions of years. J. Struct. Geol., 27(2), 327–342.

Nicol, A., Walsh, J. J., Villamor, P., Seebeck, H., and Berryman, K. R., 2010. Normal fault interactions, paleoearthquakes and growth in an active rift. J. Struct. Geol., 32(8), 1101–1113.

Otsuki, K., and Dilov, T., 2005. Evolution of hierarchical self‐similar geometry of experimental fault zones: Implications for seismic nucleation and earthquake size. J. Geophys. Res., 110(B3), p. B03303. 1-B03303. 9.

Plafker, G., and Berg, H. C., 1994. Overview of the geology and tectonic evolution of Alaska. in Plafker, G., and Berg, H. C. (Eds.). The Geology of North America, vol. G-1. The geology of Alaska. Geol. Soc. Am. Special Paper, 442, 989–1021

Schlagenhauf, A., Manighetti, I., Benedetti, L., Gaudemer, Y., Finkel, R., Malavieille, J., and Pou, K., 2011. Earthquake supercycles in Central Italy, inferred from 36Cl exposure dating. Earth Planet. Sci. Lett., 307(3), 487–500.

Sengör, A. M. C., Tüysüz, O., Imren, C., Sakinç, M., Eyidogan, H., Görür, N., LePichon, X. and Rangin, C., 2005. The North Anatolian fault: A new look. Annu. Rev. Earth Planet. Sci., 33, 37–112.

Shen, Z. K., Sun, J., Zhang, P., Wan, Y., Wang, M., Bürgmann, R., Zeng, Y., Gan, W., Liao, H. and Wang, Q., 2009. Slip maxima at fault junctions and rupturing of barriers during the 2008 Wenchuan earthquake. Nat. Geosci., 2(10), 718–724.

Tapponnier, P., and Molnar, P., 1979. Active faulting and Cenozoic tectonics of the Tien Shan, Mongolia, and Baykal regions. J. Geoph. Res., 84(B7), 3425–3459.

Tapponnier, P., Zhiqin, X., Roger, F., Meyer, B., Arnaud, N., Wittlinger, G., and Jingsui, Y., 2001. Oblique stepwise rise and growth of the Tibet Plateau. Science, 294(5547), 1671–1677.

Van Der Woerd, J., Tapponnier, P., Ryerson, F. J., Meriaux, A. S., Meyer, B., Gaudemer, Y., Meyer, B., Finkel, R.C., Caffee, M.W., Guoguang, Z. and Zhiqin, X., 2002. Uniform postglacial slip-rate along the central 600 km of the Kunlun Fault (Tibet), from 26Al, 10Be, and 14C dating of riser offsets, and climatic origin of the regional morphology. Geoph. J. Int., 148(3), 356–388.

Vermilye, J.M., and C.H. Scholz, 1998, The process zone: A microstructural view of fault growth, J. Geophys. Res., 103(B6), 12,223–12,237.

Wang, S., Fan, C., Wang, G., and Wang, E., 2008. Late Cenozoic deformation along the northwestern continuation of the Xianshuihe fault system, Eastern Tibetan Plateau. Geol. Soc. Am. Bull., 120(3–4), 312–327.

Wu, D., and Bruhn, R. L., 1994. Geometry and kinematics of active normal faults, South Oquirrh Mountains, Utah: implication for fault growth. J. Struct. Geol., 16(8), 1061–1075.

Yielding, G., Ouyed, M., King, G. C. P., and Hatzfeld, D., 1989. Active tectonics of the Algerian Atlas Mountains—evidence from aftershocks of the 1980 El Asnam earthquake. Geoph. J. Int., 99(3), 761–788.