**Table 1 : Tip splay fault networks indicative of long-term propagation of parent faults**

**Table 1, Perrin et al.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fault No.**  **(as in Fig. ES I)** | **Fault Name** | **Fault slip mode** | **Fault length (km)** | **Documented direction of long-term propagation** | **Evidence for direction of propagation** | **“Splays” developed at propagating fault tip(s)?** | **“Tree shape” of splay faults consistent with propagation?** | **Splay faults on one or both sides of fault trace** | **References** | **Structures observed at other “non-propagating” fault tip** |
| 1 | Alligerville fault | SS LL | 0,044 | South | Inferred from microfractures’ orientation | Yes | More or less because existence of different generations | One | Vermilye and Scholz, 1998 | Slight bifurcation of the fault |
| 2 | Altyn Tagh fault | SS LL | 2000 | Northeast | Sedimentation onset in splay fault-controlled basins observed to young northeastwards; long-term slip rate decreases northeastwards | Yes | Yes | One | Meyer et al., 1998; Métivier et al., 1998; Tapponnier et al., 2001 | Intersection with ~75° oblique Karakorum fault |
| 3 | Analogue faults | N | ~0.0001 | Left  &  Right | Direct observation of fault propagation in the analogue models | Yes  Yes | Yes  Yes | One  One | Mansfield and Cartwright, 2001 |  |
| 4 | Bogd fault | SS RL  & RE | ~430 | East | Secondary thrusts developed at parent fault tip become younger toward the east (Bayasgalan et al., 1999a-b) | Yes | Yes | One | Tapponnier and Molnar, 1979 | Intersection with the ~20° oblique reverse Gichgeniyn Nuruu fault bounding the Gobi Altay Range |
| 5 | Bolfin fault | SS LL | > 19 | South | Southward propagation to connect the Jorgillo fault | Yes | Yes | One | Cembrano et al, 2005 | No information |
| 6 | Camp Rock-Emerson fault zone (including Homestead and Johnson Valley faults) | SS RL | ~95 | South | Progressive decrease of cumulative slip from northern fault part to southern fault tip (Jachens et al., 2002); Emerson fault older than its southern Homestead splay (Zachariasen and Sieh, 1995) | Yes | Yes | One? | Jachens et al., 2002 | ~4 km right step to Harper Lake fault |
| 7 | Cape Egmont fault | N | ~70 | Northeast | Propagation occurred earlier than observed 3.7-0 Ma period: gentle displacement decreases toward NE in oldest 5.3 Ma horizon | Yes | Yes | Both | Nicol et al., 2005 | Existence of a small splay that might suggest a bilateral propagation |
| 8 | Cheliff fault | RE | ~91  (Boudiaf et al., 1998) | West | Growing folds and geomorphological evidence (Avouac et al., 1992; Boudiaf et al., 1998) | Yes | Yes | One | Yielding et al., 1989 | No information |
| 9 | Chelungpu fault | RE | ~80 | South | Decrease of Quaternary slip rate from northern fault tip to southern fault tip (Simoes et al., 2014) | Possibly | Yes | One | Dominguez et al., 2003 | Intersection with almost 90° oblique fault |
| 10  11  12 | David’s Way faults, observed in cross-section along fault width Wf | N | Wf1~ 0.0046 (Fig.1a)  Wf2 ~0.0008 (Fig. 1b)  Wf3 ~0.0065 (Fig. 1c) | Up  & Down  Up  Up | For the three faults, fault-strata relationships observed on the field | Yes  Yes  Yes  Yes | Yes  Yes  Yes  Yes | One  One  One  One | McGrath and Davison, 1995 | Intersection with ~80° oblique fault  No information |
| 13 | Denali fault | SS RL | ~2300 | West  &  East | Progressive decrease of cumulative offset and slip rate from fault center to western and eastern fault tips (Plafker and Berg, 1994; Lowey, 1998; Matmon et al., 2006; Mériaux et al., 2009) | Yes  Yes | Yes  Yes | One  One | Plafker and Berg, 1994 |  |
| 14 | Dixie Valley fault | N | ~80 | North  &  South | Progressive decrease of cumulative slip from fault center towards northern and southern fault tips (Wallace and Whitney, 1984) | Unclear  Yes | Unclear  Yes (however mixing with Fairview Peak splays) | Unclear  One? | Bell and Katzer, 1990 |  |
| 15 | Elsinore fault | SS RL | ~350 | South | Younger stratigraphic faulted levels in the south; more juvenile secondary faults in the south; decrease of cumulative offset and slip rate from north to south | Yes | Yes | One | Dorsey et al., 2012; see also Hull and Nicholson, 1992 for propagation evidence | Intersection with ~45° oblique San Gabriel Mountains thrust |
| 16 | Experimental fault at stage 1 | SS LL | 0.000018 | Up  &  Down | Direct observation of propagation in the experiment | Yes  Yes | Yes  Yes | One  One | Otsuki and Dilov, 2005 |  |
| 17 | Experimental fault (same as above) at stage 2 | SS LL | 0.000030 | Down | Direct observation of propagation in the experiment | Yes | Yes | One | Otsuki and Dilov, 2005 | Edge of the sample |
| 18 | Gaggade fault | N | ~80 | Northwest | Northwestward decrease of cumulative slip; paleomagnetic and geochronological evidence | Yes | Yes | One | Manighetti et al., 2001 | Intersection with ~30° oblique, ancient faults |
| 19 | Garze-Yushu fault | SS LL | ~410 | West | Western part of fault younger than farther east; westward decrease of cumulative lateral slip (Wang et al., 2008) | Yes | Yes | One | Wang et al., 2008 (Fig; 1 and 2) | ~20 km left step to Xianshui He fault |
| 20 | Glacier Lakes fault | SS LL | ~10 | West | Cumulative slip decreases towards the west | Yes | Yes | One | Kirkpatrick et al., 2008 | No information |
| 21 | Gozo Island fault | SS LL | 0.008 | Northwest | Geometry of damage fractures | Yes | Yes | One | Kim et al., 2003 | No information |
| 22 | Iron Ridge fault | N | ~8 | South | The fault has connected in late Quaternary to the southernmost Stagecoach Road fault | Yes | Yes | One? | Ferrill et al., 1999 | Intersection with ~20° oblique fault |
| 23 | J fault (Levant Basin) | N | ~13 | Northeast | Cumulative slip decreases towards the NE | Yes | Yes | One | Baudon and Cartwright, 2008 | Intersection with another, oblique fault |
| 24 | Kunlun fault | SS LL | ~1500 | West  &  East | Largest cumulative offset ~500 km east from fault center; current transfer from Kunlun to Manyi and Altyn Tagh faults; most recent westward lengthening dated at ~3 Ma  Progressive decrease of slip rate from fault center to eastern fault tip; abrupt slip rate decrease in easternmost part of fault; Sedimentation onset in splay fault-controlled basins suspected to young eastwards | Yes  Yes | Yes  Yes | Both  Both | Gaudemer et al., 1989; Van der Woerd et al., 2002; Jolivet et al., 2003; Fu and Awata, 2007  Meyer et al., 1998; Kirby et al., 2007 Harkins et al., 2010 |  |
| 25 | Lavic Lake-Bullion-Mesquite fault zone | SS RL | ~90 | North | Cumulative slip is maximum in southern half of the fault zone, and decreases northward | Yes | Yes | Both (Simons et al., 2002) | Jachens et al., 2002 | Intersection with ~55° oblique Pinto Mountain fault |
| 26 | Longmen Shan fault zone | RE with a RL component | ~480 | North | Decrease from south to north of total throw; maximum throw seems to be on southern part of Beichuan fault (Zhang et al., 2011; see also Burchfiel et al., 2008) | Yes although not very clear | Yes although not very clear | One? | Shen et al., 2009 | Connection with up to ~80° oblique thrust faults; possible existence of a southern splay network suggestive of bilateral propagation |
| 27 | Makarrasou fault | N | ~23 | North | Northward decrease of cumulative slip; geochronological evidence | Yes | Yes | One | Manighetti et al., 1998 | Intersection with 35° oblique fault |
| 28 | Millbrook Cliff fault | SS RL | ~0.0007 | Down | Inferred from microfractures’ orientation | Yes | Yes | One | Vermilye and Scholz, 1998 | Single fault trace (lacking information on larger scale) |
| 29 | Mont-Lozère fault | SS LL | 0.033 | West  &  East | Authors suggest that splaying networks make the principal fault evolving into a larger-size fault | Yes  Yes | Yes  Yes | One  One | Granier, 1985 |  |
| 30 | No name fault | SS LL | 0.017 | Southwest  &  Northeast | Splay networks consistent with modeled propagation | Yes  Yes | Yes  Yes | One  One | Lim 1998 in Willson et al., 2007 |  |
| 31 | North Anatolian fault | SS RL | ~1400 | West | Dated offsets become younger westwards | Yes | Yes | Both | Armijo et al., 1999; Hubert-Ferrari et al 2003; Sengör et al., 2005 | Intersection with the ~45° oblique East Anatolian fault |
| 32 | Pleasant Valley fault system | N | ~70 | North  &  South | Oldest part of fault is its central Pearce section (Ferrill et al., 1999); cumulative slip decreases from fault Pearce center down to northern and southern fault tips (Anders and Schlische, 1994); geomorphological evidence of bilateral propagation (Jackson and Leeder, 1994) | Yes  Yes | Yes  Yes | One  One | USGS interactive fault map (http://earthquake.usgs.gov/hazards/qfaults/map) |  |
| 33 | San Andreas fault | SS RL | ~1300 | South | Initiation in northern part around ~24 Ma, and lengthening towards the south from ~12 Ma, with development of San Jacinto and Elsinore splays in last ~5 Ma (Nicholson et al., 1994); Maximum cumulative slip of ~600 km in northern part, decreasing down to ~300 km in southern part (Suppe, 1970; Crowell, 1979); Fault trace becomes more segmented from north to south (Aviles et al., 1987); splay fault network widens and intensifies southwards (Aviles et al., 1987; Ando et al., 2009); Durmid southernmost fault segment formed ~30 ka ago (Bilham and Williams, 1985) | Yes | Yes | Both | USGS interactive fault map (http://earthquake.usgs.gov/hazards/qfaults/map) | Connection with ~70° oblique Mendocino fracture zone |
| 34 | San Jacinto  fault | SS RL | ~250 | South | Northernmost segments are fully connected in contrast to segments further south (Marliyani et al., 2013); see also stratigraphic evidence in Lutz et al., 2006 and Dorsey et al., 2012 | Yes | Yes | One | Dorsey, 2002 | Intersection with ~20° oblique San Andreas fault |
| 35 | San Sebastiano-Marsicano fault | N | ~40 | North | Overall northward decrease of cumulative displacement | Yes | Yes | One | Benedetti et al., 2013 | No information |
| 36 | Solitario Canyon fault | N | ~13 | South | Has connected in late Quaternary to the southernmost Iron Ridge fault | Yes | Yes | One | Ferrill et al., 1999 | Intersection with ~45° oblique fault |
| 37 | Solitario Canyon-Iron Ridge fault system | N | ~16 | South | Recent connection of the main Solitario Canyon fault with southernmost segments | Yes | Yes | One | Ferrill et al., 1999 | Intersection with ~45° oblique fault |
| 38 | South Alkyonides fault | N | ~46 | West | Overall westward decrease of cumulative displacement and slip rate | Yes | Yes | One | Morewood and Roberts, 1999 | Unclear whether the fault curves at high angle or stops at intersection with high angle faults |
| 39 | South Oquirrh Mountains fault | N | ~25 | North  &  South | Progressive decrease of cumulative displacement from about fault center; decreasing length of fault segments towards both the north and south | Yes  Yes | En echelon faults  Yes | --  One | Wu and Bruhn, 1994 |  |
| 40 | Strathspey-Brent-Statfjord fault | N | > 62 | North | Overall northward decrease of cumulative displacement | Yes | Yes | One | McLeod et al., 2000 | No information |
| 41 | Taupo rift fault #7 | N | ~6.3 | Northeast | Overall northeastward decrease of cumulative displacement | Yes | Yes | Both | Nicol et al., 2010 | No information |
| 42 | Thousand Springs-Warm Springs fault | N | ~35 | North | Decrease from south to north of cumulative slip, current slip rate, and mountain range elevation (Anders, 1994; Densmore et al., 2005; Payne et al., 2008) | Yes | Yes | One | Crone and Haller, 1991 | Intersection with ~40° oblique Mackay fault |
| 43 | Unamed fault, Bishop Tuffs | N | ~7 | North | Overall northward decrease of cumulative displacement | Yes | Yes | Both | Dawers and Anders, 1995 | Intersection with ~50° oblique fault |
| 44 | Unamed fault 1, Waterpocket monocline | N  (observed along width) | Width: 0.094 | Up | Authors show that splaying networks make the master fault evolving into a larger-size fault | Yes | Yes | One | Davatzes and Aydin 2003 | Intersection with ~70° oblique fault |
| 45 | Unamed fault 2, Waterpocket monocline | N | >1.5 | North | Authors show that splaying networks make the master fault evolving into a larger-size fault | Yes | Yes | One | Davatzes and Aydin 2003 | No information |
| 46 | Velino-Magnola fault | N | ~45 | North | Overall northward decrease of cumulative displacement | Yes | Yes | One | Schlagenhauf et al., 2011 | Intersection with the ~perpendicular Tre Monti fault |
| 47 | Villefort fault | SS LL | ~70 | South | Authors suggest that splaying networks make the principal fault evolving into a larger-size fault | Yes | Yes | One | Arthaud and Matte, 1975 (Fig.5) and Granier, 1985 | No information |

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