

Earth Forces EPSc 353

Relative Motions of Triple Junctions

Here is a brief summary of the procedures for determining the stability of and relative motions of triple junctions:

- 1) Construct a velocity-space diagram for the 3 plates that join at a triple junction. Call the plates **A**, **B**, and **C**. (remember: this diagram shows the velocity vectors for each of the plates and their construction into a 'velocity triangle')
- 2) If the plate boundary (i.e. between **A** and **B**) is a trench, the locus of possible triple junction positions will be on a line (call it *ab*) that is parallel to the trench and passes through the velocity of the overriding plate.
- 3) If the plate boundary (i.e. between **B** and **C**) is a ridge, the locus of possible triple junction positions will be on a line (call it *bc*) that is the perpendicular bisector of the line that connects plate **B** with that of plate **C**.
- 4) If the plate boundary (i.e. between **A** and **C**) is a transform, the locus of possible triple junction positions will be on a line (call it *ac*) that is parallel to the transform and passes through the velocity of **both** plates.
- 5) If the lines *ab*, *bc*, and *ac* all intersect at a single point, the triple junction is *stable*. If these lines *do not* have a unique intersection, the triple junction is *unstable*.
- 6) NOTE: This is just a summary, if you follow 1-5 above exactly the same every time, you will always have a trench-ridge-transform fault system!!!!