SAD uses s, the distance along a reference line as the independent variable. The reference line is either a straight line or an arc through an element. The arc is chosen for elements with nonzero `ANGLE` such as `BEND` and `MULT`, otherwise the reference line is a straight line. The reference line is an abstract object to describe the motion of particles, and not necessarily to be an orbit of a particle. Even the orbit is helical, for instance in a solenoid, the reference line is straight. An arc is always bent locally horizontally.

Such reference lines can be discontinuous at some locations such as an end of tilted `SOL` or `COORD`. SAD automatically calculates transformation of variables at such locations.