SAD uses s, the distance along a reference line as the independent variable. The reference line is either a straight an element. The arc is chosen for elements with nonzero ANGLE such as BEND and MULT, otherwise the reference line reference line is an abstract object to describe the motion of particles, and not necessarily to be an orbit of a particle. Ev 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 cal of variables at such locations.