**The flowchart**

**Basic rules of event identification:**

1. Deceleration is required for headomega peak. 2.Headomega peak is required for headtheta peak (if there is no deceleration there won’t be a headcast shown by headomega peak; if there is not head cast, larval body angle will not change).

**Extraction of decelerate-headomega peak-headtheta peak cassette (DOT assembly):**

Start → larva body motion → extraction of deceleration (>5% decrease in minimal and <15% increment in maximal tailspeed in neighboring periods) → deciding the deceleration related time window for judging headomega peak (for deceleration end speed above threshold of 0.5, start from beginning of deceleration, finish at 2 periods after ending of deceleration; for deceleration end speed below threshold of 0.5, use the same subthreshold time window that spans end of deceleration ) → (for each headomega peak, find the headomega zero point that follows, the corresponding headtheta peak is the one; if there is no corresponding headtheta peak, find the headomega zero point before it and the corresponding headtheta peak is the one) → find the found largest headtheta peak → find the corresponding headomega peak → find the corresponding deceleration → DOT cassette found