

# Gun 3 Conditioning:

## *The instructions:*

- After a “Real trip” decrease first the RF pulse length to 10 $\mu$ s and condition after the maximum power is reached. Only then it is allowed to increase the RF pulse length.

## *The idea behind:*

- A trip while running at long RF pulses can cause a significant local damage ->
  - > New emitters
  - > Even higher damage from the just-created emitters, if a long pulse is used.
- Therefore it is necessary first to get rid of those just-created emitters w/o causing further damage
  - > Conditioning at low RF pulse length

# Gun 3 Conditioning:

## *The instructions:*

- After a “Real trip” decrease first the RF pulse length to  $10\mu\text{s}$  and condition after the maximum power is reached. Only then it is allowed to increase the RF pulse length.

## *Comment:*

- Obviously not every IL means a “Real trip”

## *Questions:*

- How to define a “Real trip”?
- Is it necessary to go to  $10\mu\text{s}$  RF pulse length also after a “weak” IL (no “Real trip”)?

## *Suggestion:*

- A **“Real trip” definition**: A (multi) light detector IL accompanied with a strong vacuum event (Causing vacuum IL or close to vac. IL level)
- SMAC will **not** reset the “Real trip IL”
  - > Resp. physicist notification (SMS?)

# SMAC: Gun Water SP\_Temp ( $T_{SP}$ ) Adjustment

- Known relations:

$$T_{SP} \cong \underline{A} \cdot P_{AVER} + \underline{B}$$

$$P_{PEAK} = \underline{f_U}(P_{SP}; \{U_{HV}\})$$

- Formula for  $T_{SP}$  adjustment:

$$\begin{aligned} T_{SP}(P_{SP}) &\rightarrow T_{SP}(P_{SP\_0}) + A \cdot (P_{AVER} - P_{AVER\_0}) \\ &= \underline{T_{SP}(P_{SP\_0})} + \underline{A} \cdot (\underline{L_{RF}} \cdot \underline{RR} \cdot \underline{f_U}(P_{SP}) - \underline{L_{RF\_0}} \cdot \underline{RR\_0} \cdot \underline{f_U}(P_{SP\_0})) \end{aligned}$$

— In advance specified relations (provided by physicists)

— Parameters (GUI inputs)

— Machine settings

$L_{RF}$  : RF pulse length

$P_{AVER}$  : Average power

$P_{PEAK}$  : Peak power

$P_{SP}$  : Setpoint: Forward power

$RR$  : Repetition rate

$T_{SP}$  : Setpoint: Gun temperature

$U_{HV}$  : Klystron HV

$X_{-0}$  : Reference value of "X"

$$P_{AVER} = P_{PEAK} \cdot L_{RF} \cdot RR$$