Goals: Collect HC Data Using the New "Shunt Tile" Diagnostics in the Lower Divertor

- New Diagnostic Advantages: Shunt Tiles ("STs")
  - Excellent spatial resolution.
  - Sensitive to smaller halo currents.
- Method For Generating VDEs
  - Use Gap-Control (PCC) algorithm for shape control.
  - "Freeze" the upper and lower PF3 voltages at a given time, disabling the vertical position control.
  - Apply a differential voltage "kick" between PF3U and PF3L to push the plasma down.
- What to do with 1/2 day.
  - Test dependence of localized HC on discharge shape.
  - Verify I_P and B_T scaling of these more localized measurements.
  - Test scaling of halo currents with vertical velocity by changing the "kicking" voltage.

Starting Point: Matched B_T, I_P, at Two Values of Triangularity (s1)

- S1: Note: start with B_T=0.45, I_P=0.6, prefer D_2. May be necessary to drop I_P or raise B_T if the HC is too large.
- Low Triangularity Case: (2-4 shots)
  - Reload 129446, switch from He to D_2, downward voltage "kick" of 20V
  - Take D_2 LFS gas from this year's shot 132124
  - One shot with no PF3 Voltage Freeze, one or two shots with freeze.

  No freeze_____ With Freeze _____ _____ _____

- Higher Triangularity Case: (2-4 shots)
  - Reload 129416, switch from He to D_2, downward voltage kick of 20V
  - Take D_2 LFS gas from this year's shot 132124
  - One shot with no PF3 Voltage Freeze, one or two shots with freeze.

  No freeze_____ With Freeze _____ _____ _____

Next: I_p and B_T scans

- S2: Pick one of the two configurations in S1 or S2, based on reliability. Scan I_P and B_T to fill in the following table. Better to simply change I_P and B_T in a working shot from S1 than reload old ones. (4 Shots)

Reference Shot for this Scan:_____

I_P	B_T	Previous Examples		Shot Taken
500	0.45			
600	0.55			
700 (*)	0.55			
700 (*)	0.45			
400	0.45			

* Be careful not to saturate the Shunt Tiles, which is likely possible at the highest values of I_P/B_T.

Next Scan of Downward Kick Velocity

Goal goal of S3: assess if the level of halo current is a function of vertical velocity, as expected from "theory" (Humpreys, et al 1999). (4 Shots)
Reference Shot for this Scan:_____

Voltage Level	Ip	Bt	Shot Taken
20			
30			
40			
50			

Time Permitting go on to *either* step S4 or S5

Time Permitting: Develop a Shape with Even Higher Triangularity

- S4: Take higher-triangularity reference case
  - Reference: _129414_____ _____
- Increase the triangularity: (3 Shots)
  - Increase Flat-Top PF1A request to 0.017 kA/MA
  - Reduce the PF2 request to 0.004 kA/MA, followed by reduction to zero. Shots _____ _____ _____
- Add voltage freeze and kick-down (2 Shots).
  - Shots _____ _____ _____

Time Permitting: Repeat I_P and B_T Scans for Second Shape

(5 Shots)

Reference Shot for this Scan:_____

I_P	B_T	Previous Examples		Shot Taken
500	0.45			
600	0.55			
700 (*)	0.55			
700 (*)	0.45			
400	0.45			

* Be careful not to saturate the Shunt Tiles, which is likely possible at the highest values of I_P/B_T.