TCV Experiments towards the Development of a Plasma Exhaust Solution

- Study physics of plasma exhaust and detachment in single-null and for a wide range of alternative divertor configurations
  - Ohmic L-mode plasmas in reverse $B_T$ with density ramps or nitrogen seeding

- Basic geometric variations
  - Flux expansion $\rightarrow$ Little effect on detachment threshold
  - Divertor leg length $\rightarrow$ Decreases detachment threshold
  - Connection length $\rightarrow$ Access to deeper detachment

- Alternative divertor configurations
  - X divertor (flux flaring) $\rightarrow$ Little effect on detachment threshold, but access to deeper detachment
  - Super-X divertor (larger target radius) $\rightarrow$ Reduces $q_\parallel$ at target, but no decrease of threshold
  - Snowflake divertor (2 nearby x-points) $\rightarrow$ Little effect on detachment threshold, but access to deeper detachment

- Demonstration of predicted stable radiation zone between x-points of ‘snowflake minus’ with nitrogen seeding