

Discussion: Future pathways for the edge community

- General outlook
- Immediate needs
- How to be “impactful”

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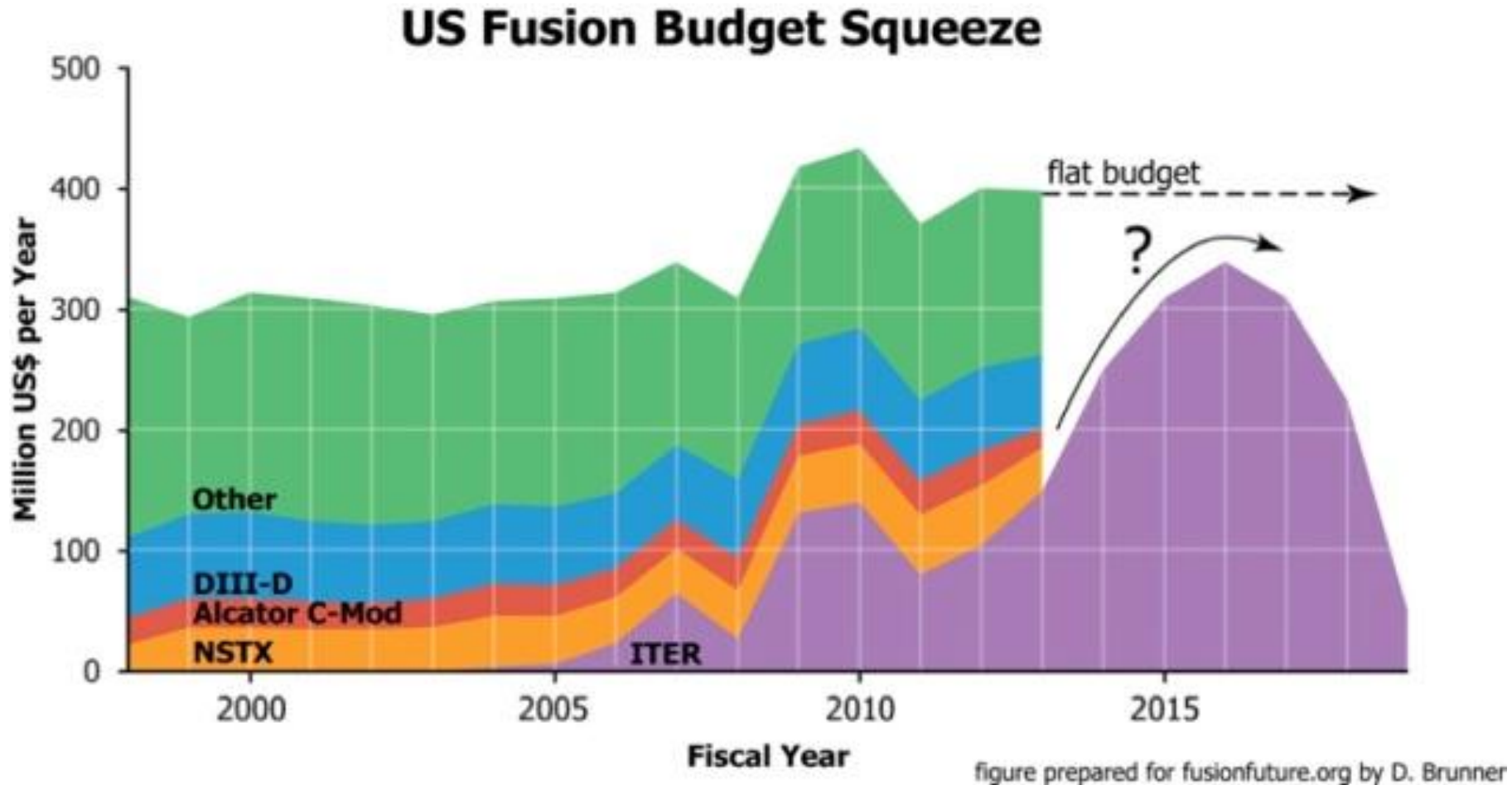
Edge Coordinating Committee Technical Meeting

Annapolis, MD
13 April 2012

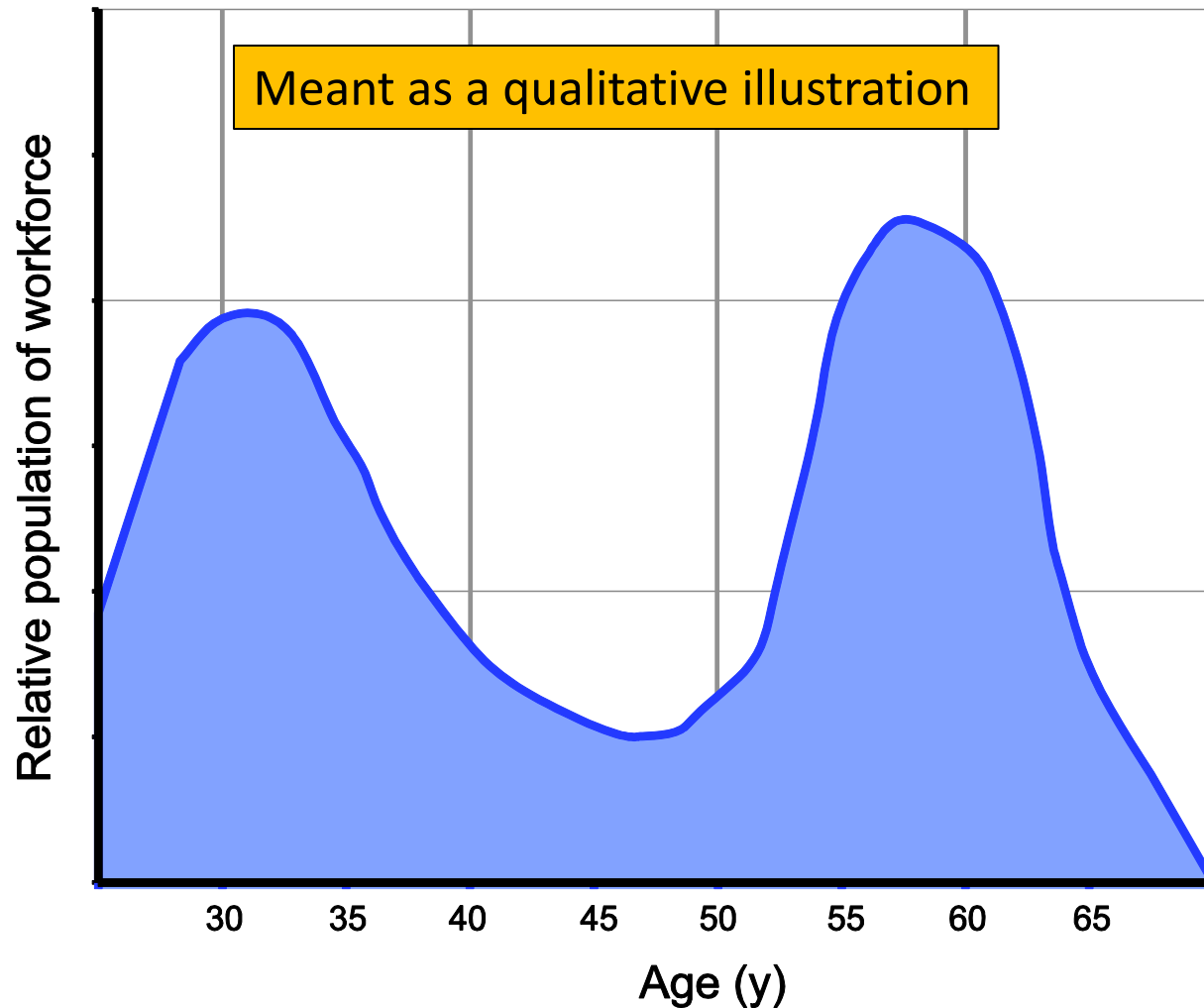
How do we maintain US productivity in tokamak edge physics?

- Modeling/experiment connections make program stronger → function of the ECC
- Resources for both modeling and experiment appear to be in short supply: how do we effectively utilize these resources?
- Time to get serious about strategy

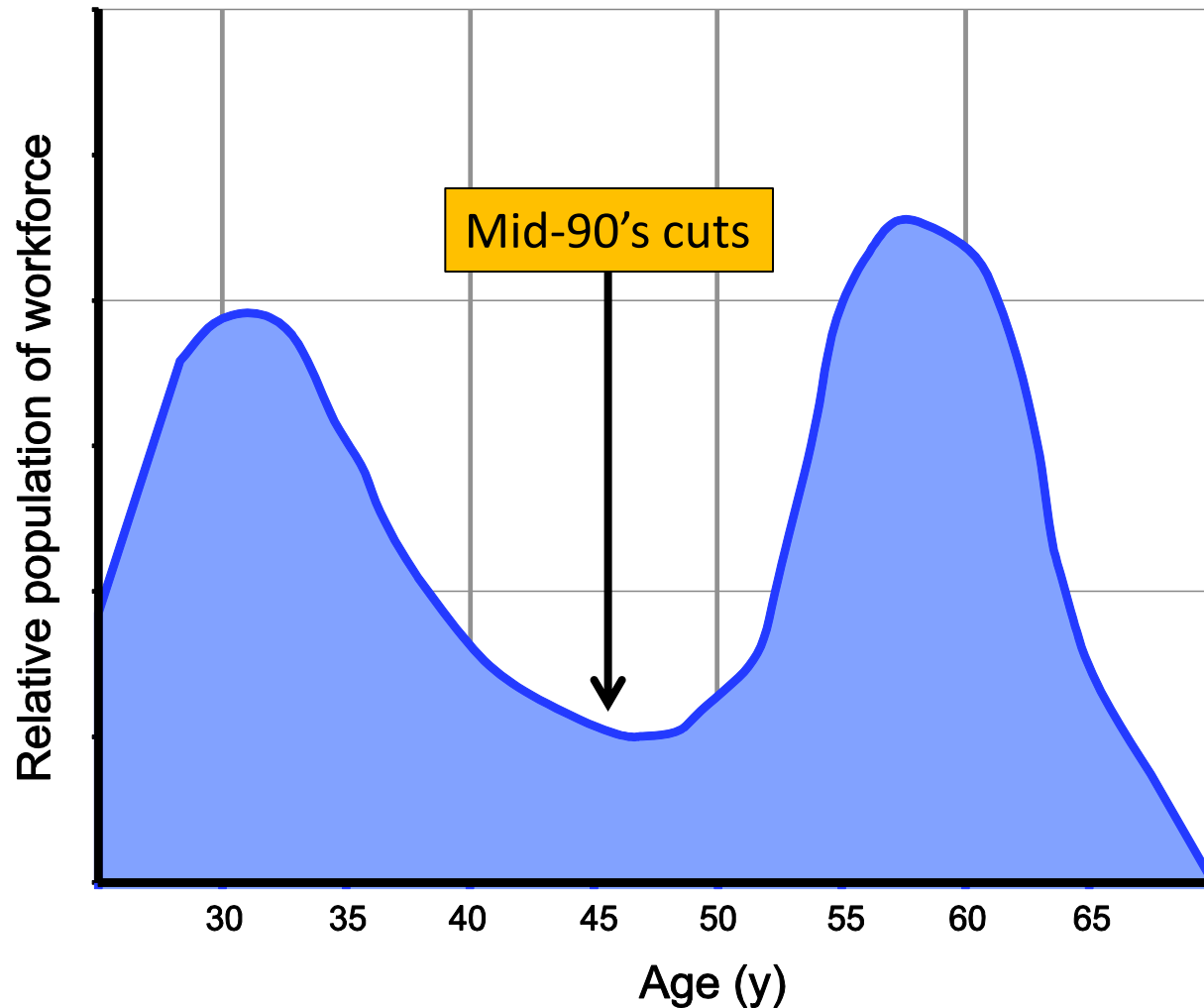
Budget challenges are very clear, and very serious for US MFE



What are implications for US MFE workforce?

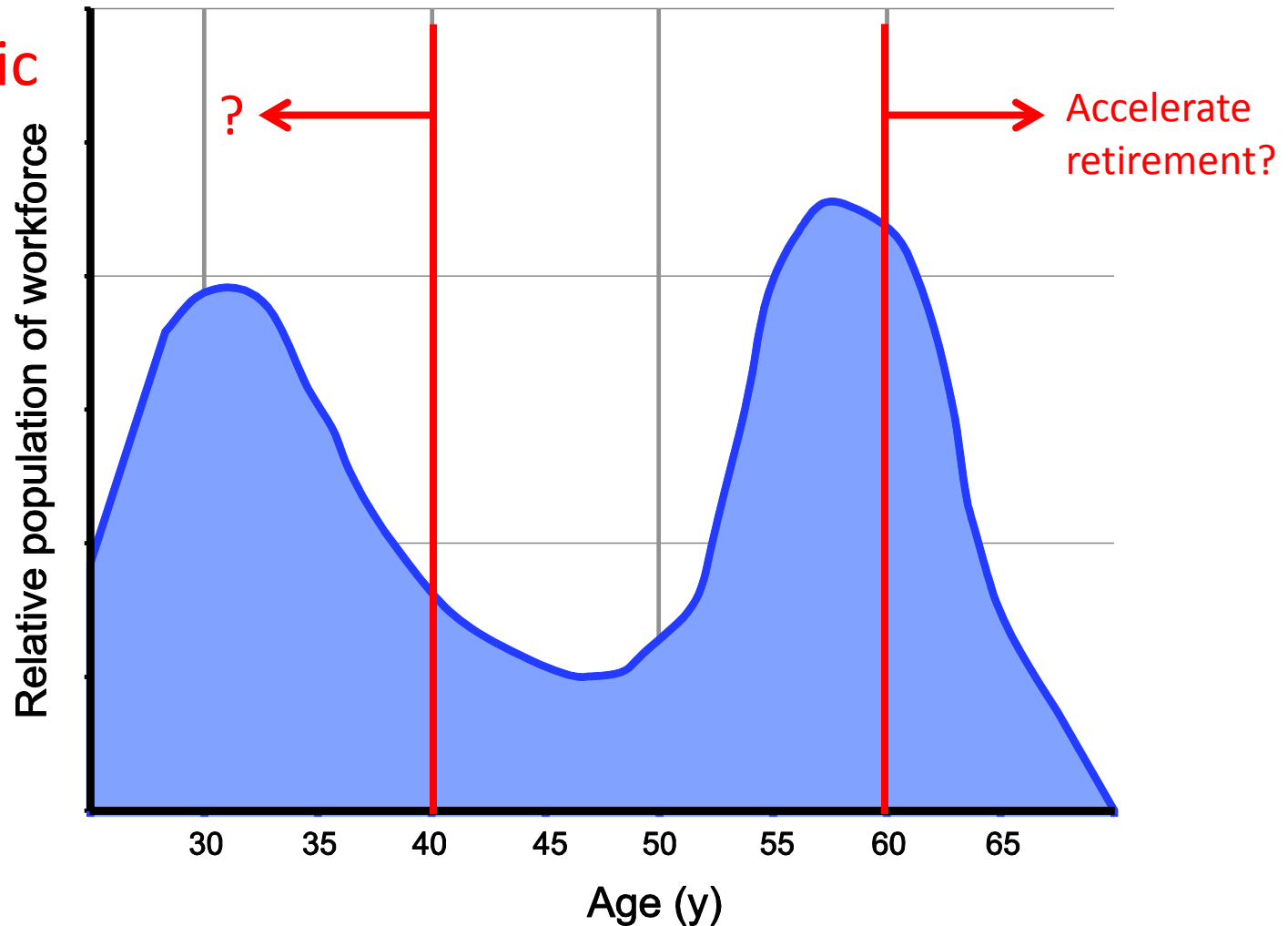


What are implications for US MFE workforce?

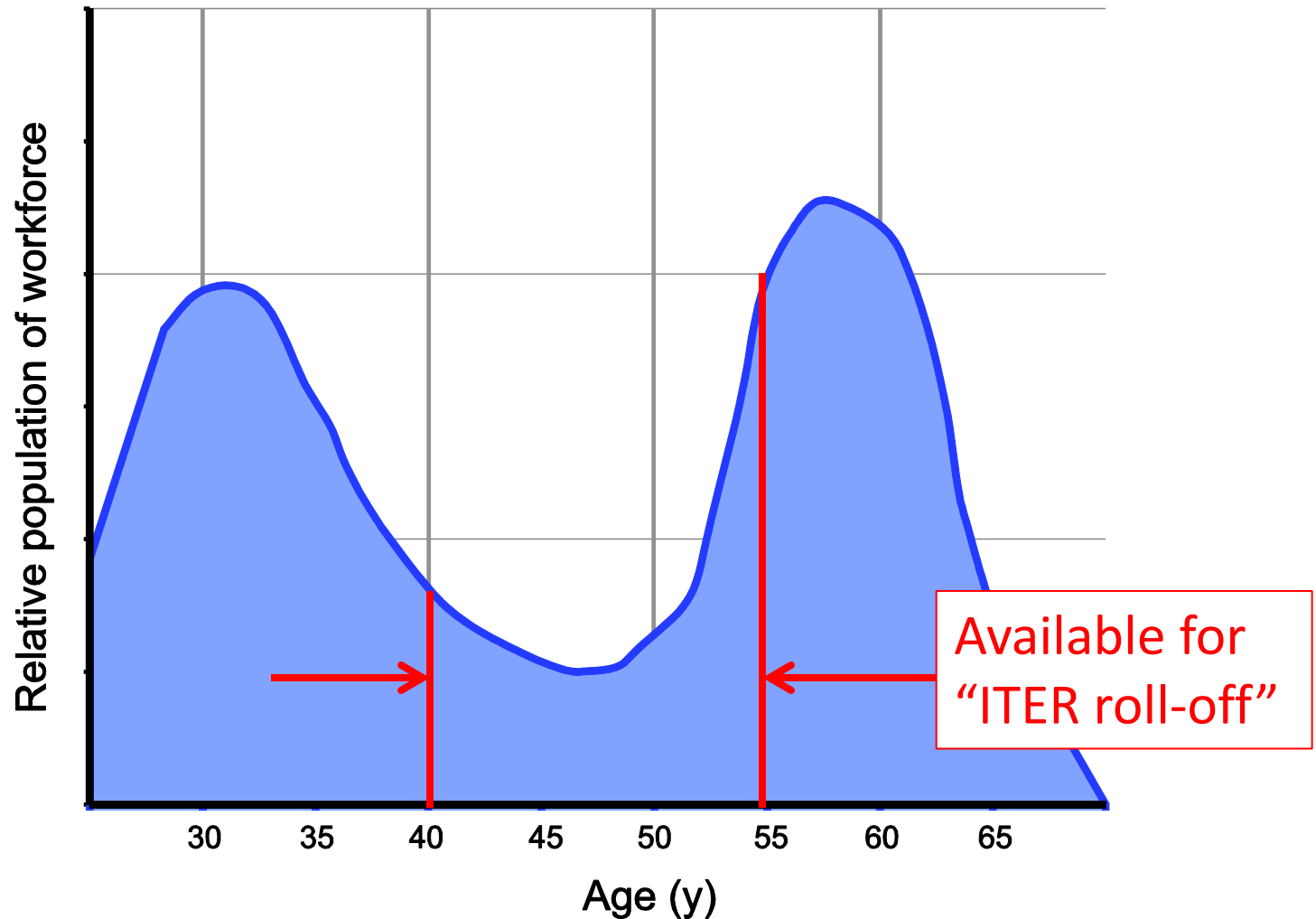


What are implications for US MFE workforce?

Domestic
Cuts
Today?



What are implications for US MFE workforce?



The take-away:

- In addition to short-term budget uncertainty, severe strains on the US program lie ahead
- Unless drastic changes occur, severe loss of manpower is likely
- Consider:
 - What are the top priorities for plasma edge research for the next 1—2 years?
 - How do we best attack these problems with diminishing domestic resources?
 - Is there a compelling set of problems that we can propose to solve over a ~5 year time frame? Is this useful?
 - Can FES provide a game plan, or at least some guidance?

Establish working groups to maintain FY11 JRT progress?

- At previous ECC meeting in November, it was proposed that we
 - Assemble a list of priority topics in pedestal research
 - Choose ~ 2 main topics for voluntary working group activity
- Does this interest people? How best to organize?
- Should we use WGs to transition into modeling support for FY13 JRT?
- Can the same approach be useful for other edge research areas?
 - L-H transition dynamics
 - SOL thermal/particle transport
 - Edge wave-plasma interactions
 - Materials interface

Some priority areas in pedestal research

Follows from current and *proposed* ITPA Pedestal Group focus areas and ITER urgent tasks, also key issues emerging from FY11 JRT

Structure of the Fully Developed Pedestal	<ul style="list-style-type: none">• ITPA WG objective 4.6: Theoretical models for pedestal width• Can gyrokinetics provide a standard picture for microstability in the pedestal, and its role in determining structure?• How can experiment support GK modeling effort?
Dynamics and Transport between ELMs	<ul style="list-style-type: none">• Can we determine importance of fluctuation-driven transport?• Can we learn how to predict timescales for pedestal evolution?• Is there an ELM “trigger”?
Impact of neutral source and particle transport	<ul style="list-style-type: none">• ITPA WG objective 4.2: Examine effect of heating sources on density pedestal• From experiment, can we definitively measure a density pinch in the pedestal?
Steady ELM free and small ELM regimes	<ul style="list-style-type: none">• ITPA WG objective 4.5: Assess ITER-viability of QH-mode (add I-mode?)• Topic of the FY13 JRT• What gives rise to the “wall” that prevents ELM?• Is there a clear picture of how separate transport channels can undergo differing levels of suppression?