# From Beam-target to Thermonuclear Fusion in the Dense Plasma Focus Pinch: Energy throughput scaling

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I: Background concepts:

1. Electromagnetic drive, MRN and typical speeds, Speed factor S
2. Mach >> 1 driven plasmas, temperature vs speed
3. Cross-sections for nuclear fusion: beam-target and thermonuclear

II: II: DPF Fusion: Beam-target predominance: Throughput scaling

1. Inductive voltages generate tens to hundreds of keV
2. Shock speed generates around 0.5 keV
3. Optimum pinch conditions for neutron yield in beam-target mode
4. Throughput (Output/Input) Scaling to break-even Q =1
5. Breakeven point found through numerical experiments

III: Transitioning to thermonuclear mode

1. How?
2. Optimum conditions for neutron yield in thermonuclear mode
3. Throughput (Output/Input) Scaling to break-even Q =1
4. Breakeven point found through numerical experiments

IV: Beam-target (DPFQ1) breakeven point compared to thermonuclear breakeven point

1 Proposing a feasible test point DPF0.01
2 Conclusions

A talk to be given at the University of York on Friday 17 November 2017.