High Intensity Accelerators - General

- **J.P. Revol**: review ADS, goals formulated

  power 1..10MW, low losses, reliability, stability, cost
- **A.Mueller, F.Bouly**: s.c. linac technology worked our for MYRRHA; well advanced; redundancy within linac
- **P.Mandrillon:** new cyclotron concepts: Texas A&M - s.c. and stacked cyclotron with strong focusing; AIMA reverse valley cyclotron for H_2^+ with 3 beams injected at low energy (60kV)
- **R.Barlow:** Daedalus H_2^+ cyclotron for 4.8MW; FFAG with strong focusing, large acceptance
- good: 5-10 MW within reach of todays technology (e.g. ESS)
- major problem: reliability/# beam trips

  today: 10…100 per day (PSI, SNS)

  goal ADS: 0.01…0.1 per day

High Intensity Accelerators - Concepts

	cyclotron	sc. linac	RCS*	FFAG**
example, power [MW]	PSI (CH) 1.4	SNS (US) 1.2 (1.4)	J-PARC (JP) 0.3 (1.0)	
Pro	• cyclic (cost) • efficient (PSI:18%) • compact	• lowest losses • high energy • redundancy	• cyclic (cost)	• cyclic (cost) • strong focusing
Contra	• limited E_k (≈1GeV) • extraction! • tedious tuning	• expensive • less efficient • couplers	• pulsed (space charge, target etc.)	• CW difficult • extraction?
assessment	PSI concept for 3-5MW (at max); other promising concepts, not worked out (cost, details)	obvious solution today with details worked out, but expansive	likely not suited for high power	practical aspects not worked out

* Rapid Cycling Synchrotron

** Fixed Focus Alternating Gradient accelerator

High Intensity Accelerators for ADS

- new concepts should be developed and evaluated continuously to reduce cost; comparative assessment must be objective (similar to e.g. International Technology Recommendation Panel ITRP for Linear Colliders)
- s.c. linacs are most advanced but need further optimization, e.g. energy efficiency, trips
- **despite of a healthy competition the community should support established projects in a coherent way**