

Subject	704 MHz	1408 MHz
Beam Dynamics		<ul style="list-style-type: none"> • Longitudinal impedance for short range wake field is 4x larger: worse situation for periodic transient beam loading • Transverse impedance is 4x larger • Beam dynamics less favorable (need for twice better phase control accuracy)
SC cavities : vibrations	<ul style="list-style-type: none"> • Similar difficulties wrt mechanical vibrations thanks to the girder. 	
SC cavities : gradient	<ul style="list-style-type: none"> • Independent of frequency • Dependant on beta • Reasonable gradient for acceptable yield (beta=1): 16-23 MV/m 	
RF hardware	<ul style="list-style-type: none"> • Less expertise around the world • Less commercially available parts • Larger size components 	<ul style="list-style-type: none"> • Less powerful klystrons (average) ? • Limited average power capability of components (wg items, couplers...)
	<ul style="list-style-type: none"> • RF distribution scheme: similar issue at both frequencies • Klystron modulators: similar issue at both frequencies 	
Cryogenics	<ul style="list-style-type: none"> • HPSPL undoubtedly needs ~2K Helium, although not necessarily superfluid. • Need to investigate further the benefits of lowest temperature for the LPSPL • Adoption of existing (=ILC) hardware design is premature • Possibility of a staged approach compatible with beginning at ~ 4K and progressively reducing to 2.5 K? 	
Other subjects	<ul style="list-style-type: none"> • Cavity filling times is 4x longer, which increases the total RF pulse length and, hence, the stored energy in the modulator • Lower efficiency (beam power/grid power), especially for HPSPL. 	<ul style="list-style-type: none"> • Larger variety of cavities • Accelerator is ~10% longer • CEA-Saclay test system cannot be used • No 1400 MHz high power RF test place anywhere... • Less synergy with ESS...

Required studies for clear conclusions:

1. Intensity limits with 704 MHz (1408 MHz ?) – Longitudinal and transverse collective effects.
2. Is superfluid Helium necessary?
3. If not, possibility of a staged approach for cryogenics, compatible with temperature in the range between 4.5 - 2.5 K.