

A Possible FEL Based on LEP Superconducting Cavities, R. CORSINI, A. HOFMANN, CERN - After the shutdown of LEP, superconducting accelerating cavities operating at 352 MHz with a total voltage of about 2.7 GV will become available for other uses. As a possible application they could become the building blocks for a linear accelerator delivering a beam suitable as a driver for a Free Electron Laser operating in the VUV and soft X-ray region. There are a number of interesting science applications in this spectral region. In particular the "water window" between the absorption edge of Oxygen ($\lambda = 2.3$ nm) and Carbon ($\lambda = 4.7$ nm) is suitable for imaging biological samples imbedded in water. Preliminary calculations show that it is feasible to optimize an FEL for this application. With 1.5 GeV electron beam energy, a state-of-the-art technology for a wiggler of period $\lambda_u \hat{A} 30$ mm and total length around 20 m and for an injector of normalized emittance $\epsilon_n = 2 \pi$ mm mrad some GW of peak power can be obtained. By using the full available linac energy the spectral range of the FEL can be extended to shorter wave lengths.