

How to Save Money for a Vacuum System of a Third Generation Synchrotron Light Source,

F. GIACUZZO, J. MIERTUSOVA, Sincrotrone Trieste, S.p.A. - Vacuum systems of third generation synchrotron light sources should guarantee the following features: i) sufficiently long beam lifetimes due to beam gas scattering, ii) short conditioning time and iii) simplicity which easily allows modifications for new installations. Due to high stored beam currents the wall conditioning is fast and low specific outgassing rates

($\sim 10^{-13}$ mbar.l/s.cm²) are reached. A simple and cheap bake-out system seems to be sufficient, even a start up without bake-out could be considered. The low specific outgassing rate results in smooth pressure profiles between pumps, therefore the number of pumps can be reduced. It is convenient to make a fore vacuum in the 10^{-7} mbar pressure range by auxiliary turbo-pumps. Then the UHV conditions can be maintained by sputter-ion pumps (SIPs) of a modest nominal pumping speed. Insertion device vacuum chambers of 5 to 6 m in length can be sufficiently pumped by pumps installed at both ends of the device only. About 20 SIPs can be supplied by one power supply in the pressure range $10^{-10} \div 10^{-7}$ mbar. The positions of gauges for total and partial pressure measurements have to be carefully chosen, since they are strongly affected by external electromagnetic fields and photoelectrons. Thus, taking this experience into account, the costs of a vacuum system can be significantly reduced.