A Review of Difficulties in Achieving Short Bunches in Storage Rings*, C. LIMBORG, SSRL/SLAC** - During the last few years, the potential of electron storage rings for the production of short bunches has been thoroughly investigated. The beam-wall interaction in general was reconsidered for 3rd generation synchrotron sources. The mechanism of the so-called "microwave" instability, responsible for bunch lengthening and energy widening, was clarified in all details from a theoretical point of view. Predictions were confirmed with results from tracking code simulations and experimental data. A result of these studies is that harmonic cavities are ineffective for either shortening the bunch or substantially raising the instability threshold. Extensive investigations were performed on quasi isochronous lattices. Many rings were operated with very low momentum compaction optics, above and below transition energy. Experimental results in full agreement with theoretical prediction confirm that unfortunately short bunches are very hard to produce.

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