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### Digital Applications with High- $T_c$ Superconductors

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One of the early predictions for high- $T_c$  superconductors was their application in digital systems. Not only would the power consumption for cooling be down by a factor of 100, but also the achievable clock rates would be much higher. At that time, the prospects for high-current applications were quite pessimistic. Nowadays, the situation is reversed: the prospects for high-current applications are excellent, especially for magnets, and the prospects for high- $T_c$  digital applications are dim. There reasons are partially technology related, but also related to the needs of the society - complex material issues require big investments and such investments are easier to defend for a room temperature technology than for a cryogenic one: until the need arises that can only be solved by a cryogenic technology. But there is no need to wait, quite a number of applications have successfully been demonstrated in the past. And there are still quite a number of applications around that can be solved with the current technology or with technologies which will mature soon: grain-boundary junctions either on bi-crystals or on step-edges allow the preparation of circuits with a small number of junctions and direct writing of Josephson junctions may yield a tool to create an even larger number of Josephson junctions for digital applications. Since currently only thin film covered substrates with one or two layers of high- $T_c$  superconductors are commercially available, the selection of the right family of Josephson digital circuits is in this context essential.

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