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Properties of CVD silicon carbide mirror substrates

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The thermal loading on the optical components of third generation synchrotron systems is putting severe restrictions on the design and materials of these components to ensure that they maintain their pointing and beam forming characteristics. Recent advances in the properties and reliability of CVD silicon carbide, coupled with newly developed techniques in optical fabrication have resulted in a monolithic, integrally cooled SiC mirror substrate model that can be manufactured at a cost which makes it viable. Two examples have been fabricated and we report on their thermal and mechanical characteristics, together with an assessment of the potential for extrapolating the design and the process to larger sizes.