

482. Title:Direct creation of black silicon using femtosecond laser pulses

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Abstract:Using a direct femtosecond laser surface structuring technique, an array of equally spaced parallel nanostructure-textured microgrooves on silicon was produced that causes a dramatic reduction of the treated silicon reflectance. The processed area appears velvet black at all viewing angles. Throughout the visible region, the reflectance of the blackened surface is less than 5%. The antireflection effect of the processed surface also extends to the mid-infrared wavelength range. Furthermore, this technique has a potential in reducing silicon reflectance at terahertz frequencies and even in millimeter wavelength range.