Title: Laser surface patterning using a Michelson interferometer and femtosecond laser radiation

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Abstract: We report on a simple method to obtain surface gratings using a Michelson interferometer and femtosecond laser radiation. In the optical setup used, two parallel laser beams are generated using a beam splitter and then focused using the same focusing lens. An interference pattern is created in the focal plane of the focusing lens, which can be used to pattern the surface of materials. The main advantage of this method is that the optical paths difference of the interfering beams is independent of the distance between the beams. As a result, the fringes period can be varied without a need for major realignment of the optical system and the time coincidence between the interfering beams can be easily monitored. The potential of the method was demonstrated by patterning surface gratings with different periods on titanium surfaces in air.

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