Model of chip formation during turning in the presence of a built-up edge (BUE)

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During turning, in the course of the deformation of the material, a metallic deposit, a so-called built-up edge (BUE), may occasionally form, which may damage the surface and shorten the tool life. We have observed the effect thereof on chip formation using microscopic techniques and have developed a mathematical model for this process. Laboratory experience confirms the numeric solution of the time-delayed autonomous differential equations. This model can be applied to other technologies as well where the thickness of the undeformed chip varies.

Keywords: cutting, chip formation, mathematical model, built-up edge (BUE)

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