Surface functionnalization of bulk metallic glasses by femtosecond laser processing.

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Metallic glasses are known for their high mechanical resistance and their ability to become viscous at relatively low temperatures. Functionalisation of their surface is a promising way to increase their use in industry, in particular in medical, jewellery and microelectronic sectors. In this work, femtosecond laser processing is used to pattern metallic glass surfaces.
Depending on processing conditions, two different textures can be produced, surface ripples consisting of low frequency LIPSS (laser-induced periodic surface structures) at fluencies near the ablation threshold, and micron size grooves resulting from hydrodynamic surface instabilities at higher fluencies. Chemical and physical characterizations of these structures are performed and their impact on the surface properties are investigated.
It appears that femtosecond laser processing shows some specificities in the case of amorphous alloys compared to crystalline metals and the effects of processing on functional properties such as wettability or corrosion resistance are investigated.