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Coloring of metals and metal alloys surfaces by using 150 KHz fiber femtosecond laser MAZHAR IQBAL, RASHID GANEEV, GANJABOY BOLTAEV , ALI ALNASER , Department of Physics, American University of Sharjah, Sharjah, UAE — Metal coloring is fascinating in scientific and non-scientific communities alike. Whether it is for just artistic, decorative features or, and scientific functional applications, laser coloring has very promising impact. Laser based coloring technique is completely eco friendly and is quite flexible in achieving the desired results. We have used a high power fiber femtosecond laser at 150 KHz repetition rate, which reduces the processing time momentarily. We have produced permanent and angle dependent colors on Aluminum, Copper, Steel and metal alloys, on smooth as well as on uneven surfaces by laser induced periodic surface structures and non-periodic nano/microstructuring. Permanent and angle dependent colors of surfaces can be erased and recolored according to the desired goals. We studied the optical properties of different colors along with the wettability of the surfaces of the metals and metal alloys. The results show that we can make reflectance-controllable surfaces and surfaces varying from hydrophilic to superhydrophobic.

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