National Institute of Technology Rourkela

Departmental Seminar

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| Seminar Title | : Localized plastic deformation in Fe-Mn-C steels following the profilometry-based indentation plastometry (PIP) tests |
| Speaker | : Arnab Sarkar |
| Supervisor | : 7432883582 |
| Venue | : Seminar Room Annexe Building MM Department |
| Date and Time | : 16 Dec 2024 (03:30pm) |
| Abstract | : Fe-Mn-C steels, often referred to as high-manganese steels, have garnered significant attention in the field of automotive, construction and mining industry due to their excellent combination of mechanical properties as well as corrosion and wear resistance behavior. The present work focuses on the structure-property relationships of high manganese (Mn) steel subjected to heat treatment (HT) within 300˚C to 500˚C. The formation of carbides with the increasing temperature and the emergence of deformation bands following the PIP test resulted in a monotonous increment of the strength and hardness of the steel. However, the localized presence of these carbides became the potential site for the initiation of cracks, adversely affecting the overall tensile properties. The post-EBSD characterization revealed a severity in strain localization within evolving deformation bands, resulting in the continuous decrease in uniform strain and the corresponding increase in the tensile strength of 500˚C-HT specimen. The deformation substructures comprising the complex network of dislocations within the deformation band became more prominent for the abovementioned specimens. |