In this issue

Rubber pressure moulding technique

Fibre reinforced plastic (FRP) products are now regularly used in the stress critical applications, as more and more designers are realizing its high specific strength and stiffness properties. But the casting of FRP component is more difficult than the casting of metal, because the liquid metal has good flowability and can easily flow into the gating channel for filling the mould cavity. During the manufacture of FRP components, polymer being a liquid with low viscosity has good flowability, whereas the fibres have high stiffness and do not take shape easily over the high curvature of FRP components. Therefore, application of pressure is an important parameter to provide shaping of material before solidification of polymer. This is much more critical in case of complex-shaped geometry. Several methods, i.e. filament winding, pultrusion method, vacuum bagging technique, autoclave technique, matching die set compression molding, resin transfer

molding, etc. have been developed to manufacture FRP products. Among these methods, the autoclave technique is a best method but an expensive process due to the requirement of expensive tooling and disposable bagging materials. In this scenario a rubber pressure moulding (RPM) technique is developed to prepare fibre reinforced plastic components (FRP) having complex geometry. The technique is based on the matching die set, where the die is made of hard metal like steel and the punch from flexible rubber-like materials. The use of flexible rubber punch helps to intensify and uniformly redistribute pressure (both operating pressure and developed hydrostatic pressure due to the flexible rubber punch) on the surface of the product. Burn test, scanning electron microscopy and mechanical tests like interlaminar fracture toughness, interlaminar shear test, tension test, etc. were carried out to evaluate its performances in the structural applications. See page 1492.

Late Quaternary glaciation

R. K. Pant *et al.* (**page 1500**) attempt to reconstruct the late Quaternary glacial history based on Lateral moraine stratigraphy and use them as surrogate for the extent of relative ice volume and temperature changes. The climate sensitive modern Equilibrium Line Altitude (ELA) was estimated using cloud free IRS-False Colour Composite (FCC). This was used as a reference with which the palaeo ELAs were compared. The paleo-ELAs were estimated by the altitude of the emergence of lateral moraines. Estimation of paleo-ELA was done for the first time from the higher central Himalaya. They provide methodology for the selection of least disturbed glacial sequence that is important for palaeo-ELA reconstruction hence the climate.

The authors demonstrate that three glacial advancements are well preserved in the Goriganga basin. The oldest advancement (Stage-I) appears to be the longest and oldest. This event pre-dates the Last Glacial Maximum (LGM) and is based on firm chronological constrain obtained from the proglacial relict lake sediment (Burfu). Evidence similar to this was obtained from the adjoining Kaliganga basin (Garbayang). This is interesting considering that LGM was the period of maximum ice volume extent in the northern latitude; however, in the present case (temperate glacier) LGM was limited in extent due to weak southwest monsoon.

They further indicate that the Trans Himadri Fault (THF) not only controlled the extent of valley glaciation but was episodically active during the late Quaternary and continued till the Holocene.

Non-invasive ophthalmic imaging

The use of optical techniques for biomedical imaging is receiving attention because these can provide sub-millimetre resolution imaging without the need for ionizing radiation and associated risks. Optical coherence tomography (OCT), the approach that exploits the loss of coherence of the scattered light to filter it out from the unscattered image bearing component, is finding clinical applications in ophthalmology, dermatology, etc. In this issue, Rao *et al.* (**page 1506**) describe the implementation of single mode fibre based OCT setup and demonstrate its use, for noninvasive imaging of adult Zebrafish eye. The images of whole eye, cornea, and retina acquired with the set-up have been used to estimate several ocular parameters, viz. corneal thickness, mean retinal thickness, and effective refractive index of the crystalline lens. Such measurements may help in studying the development of anterior segment of eye in mutants of Zebrafish, which are being used as model system for understanding a variety of ophthalmic diseases like retinal detachment, and blindness.