The nature of hydrological seasonality over the Himalayan Glaciated Region (HGR)
is complex due to varied climatic and precipitation patterns. We attempt to exemplify
the spatio-temporal variation of hydrological mass over the HGR using a time
variable gravity field from the GRACE satellite for the period 2002-2014 on seasonal
and inter-annual time scales. The mass signal derived from GRACE data is
decomposed using Empirical orthogonal Functions (EOF), which allows to identify
causes of mass change within HGR and delineate the three broad divisions viz
Western, Central, and Eastern, divisions of HGR based on the seasonal mass gain
or loss that corroborate with prevailing climatic models. We also find that the
Western region registers a different pattern compared to the rest i.e. mass gain of
the Hindukush and Karakorum Glaciers. It appears that this mass gain was initiated
due to the excessive snowfall in 2005-2008. However, as our results indicate, in
spite of dampening of snowfall rates after 2008, mass has been steadily increasing.
This is attributed to the lowering and to stabilizing of temperature increases in this
region after 2008.