Energy transfers in large-scale and small-scale dynamos MAHEN-
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MAR, IIT Kanpur, India — We present the energy transfers, mainly energy fluxes
and shell-to-shell energy transfers in small-scale dynamo (SSD) and large-scale dy-
namo (LSD) using numerical simulations of MHD turbulence for Pm = 20 (SSD)
and for Pm = 0.2 on 1024^3 grid. For SSD, we demonstrate that the magnetic energy
growth is caused by nonlocal energy transfers from the large-scale or forcing-scale
velocity field to small-scale magnetic field. The peak of these energy transfers move
towards lower wavenumbers as dynamo evolves, which is the reason for the growth
of the magnetic fields at the large scales. The energy transfers U2U (velocity to
velocity) and B2B (magnetic to magnetic) are forward and local. For LSD, we show
that the magnetic energy growth takes place via energy transfers from large-scale
velocity field to large-scale magnetic field. We observe forward U2U and B2B energy
flux, similar to SSD.[1]

[1]R. Kumar, M. K. Verma, and R. Samtaney, EPL, **104**, 54001 (2013); J. Turbulence,
16, 1114, (2015).

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