

# Magnetic and current helicities in solar dynamos

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Solar cyclic activity is connected with a dynamo wave of magnetic field propagating somewhere inside the solar convective zone. The dynamo wave is supported by joint action of differential rotation and so-called alpha-effect, which is determined by the level of mirror asymmetry or turbulence. For decades, astronomers and astrophysicists had no direct observational information concerning alpha-effect. At the same time, alpha-effect remains inaccessible for direct laboratory experiments. Observations of current helicity in solar active regions open at first time a unique possibility for direct observation of alpha effect. The point is that the current helicity is associated with so-called magnetic helicity which directly participates in determination of the alpha effect. Moreover, the magnetic helicity hardly can be transported by spectral fluxes because the capacity of Kolmogorovian type spectrum is very limited in respect of magnetic helicity. Being an inviscid integral of motion, magnetic helicity accumulates in large scales and give severe constraints for solar dynamo action. In the talk presented, we compare the available current helicity observations obtained at Huairou solar station with predictions of solar dynamo models concerning helicity dynamics.