

# Dynamical Scaling and the Finite Capacity Anomaly in 3-Wave Turbulence

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We present a systematic study of the dynamical scaling process leading to the establishment of the Kolmogorov--Zakharov (KZ) spectrum in weak 3-wave turbulence. In the finite capacity case, in which the transient spectrum reaches infinite frequency in finite time, the dynamical scaling exponent is anomalous in the sense that it cannot be determined from dimensional considerations. As a consequence, the transient spectrum preceding the establishment of the steady state is steeper than the KZ spectrum. Constant energy flux is actually established from right to left in frequency space after the singularity of the transient solution. From arguments based on entropy production, a steeper transient spectrum is heuristically plausible.

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