Asymptotic expansion of solutions to the dissipative equation with fractional dissipation

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The Cauchy problem for the dissipative equation with fractional Laplacian is studied. The dissipative effect of this equation is anomalous. The aim is to derive the large-time behavior and the spatial-decay of solutions to this Cauchy problem. Especially the difference between solutions and their asymptotic expansion is given. When the dissipative equation with anomalous diffusion is studied, since the Fourier-symbol of the fundamental solution is not smooth, it is difficult to derive the asymptotic expansion of solutions. The renormalization is applied in order to avoid this difficulty.

References

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