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題　目：　Influence of noise on dissipative solitons and their interaction

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場　所：中央大学後楽園キャンパス３号館３階３３００号教室
（〒112-8551　文京区春日１-１３-２７；東京メトロ丸の内線, 南北線「後楽園駅」,
または都営地下鉄大江戸線, 三田線「春日駅」から徒歩５分）

概　要：We give an overview of the influence of noise on spatially localized patterns and their interaction. Localized patterns include stationary dissipative solitons, oscillatory dissipative solitons with one and two frequencies as well as exploding dissipative solitons. The influence of noise on spatially localized structures of arbitrary length, which are localized due to the trapping mechanism, has been investigated in [1] and it was shown that the logarithm of the lifetime scales inversely with the noise intensity. Thus the picture of a noise-activated barrier crossing has been demonstrated. A long standing puzzle in the field of pattern formation has been the experimental observation of the partial annihilation of pulses in binary fluid convection [2] and during CO oxidation in surface reactions [3,4] it has been shown that already a small amount of additive noise can account for the experimental observation. The mechanism will be elucidated in the presentation. Recently it has been shown that a small amount of noise can induce explosions for dissipative solitons in the vicinity of the transition sequence from stationary dissipative solitons to exploding dissipative solitons via three different routes [6,7]. We also investigate the influence of large noise on the formation of localized patterns in the framework of the cubic-quintic complex Ginzburg-Landau equation. The interaction of localization and noise can lead to filling-in or noisy localized structures for fixed noise strength. To focus on the interaction between noise and localization we cover a region in parameter space, in particular subcriticality, for which stationary stable deterministic pulses do not exist [8]. Possible experimental tests of the work presented for autocatalytic chemical reactions and bio-inspired systems are outlined. Finally we present some of our recent results on the influence of spatially homogeneous multiplicative noise on spatially localized solutions in nonequilibrium systems.

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