

## Asymmetrical Diffusion-Induced Directional Motion

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Asymmetrical Diffusion-Induced Directional Motion

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Abstract:Competition between anomalous diffusion and normal diffusion  
along two different directions of the  
track for a Brownian motor, combined with a periodic potential  
flashing, can lead to a macroscopic motion. The current is  
calculated analytically by using the Astumian-Bier's approach of  
the step number per cycle.

It is shown that the direction of current occurs reversal for  
different waiting times of the potential off and the magnitude of  
current is prominently enhanced. Moreover,

a thermal "green" noise is  
proposed to produce the ballistic diffusion, numerical simulations  
for the average velocity of the particle in the presence of  
ballistic and normal diffusions support the present theoretical findings.

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