

## Molecular motor manipulation controlled by light

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A new concept of molecular motor using optical tweezers within a modified optical add-drop filter known as PANDA ring resonator is proposed. By using dark and bright solitons, the orthogonal tweezers can be formed within the system and detected simultaneously at the output ports. Under the resonant condition, the optical tweezers generated by dark and bright soliton pair corresponding to the left-hand and right-hand rotating solitons (tweezers) can be generated. When a soliton is interacted by an object, an angular momentum of either bright or dark tweezers is imparted to the object, in which two possible spin states known as molecular (tweezers) spins are exhibited. Furthermore, an array of molecular spins, i.e. trapped molecules can be generated and detected by the proposed system, which can be used to form large scale molecular spin generation. In application, the trapped molecules can be moved and rotated to the required destination, which can be useful for many applications, especially, in medical diagnosis and therapy.