## **Supplementary Information for Reconfigurable Optical**

## Manipulation by Phase Change Material Waveguide

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## 1. Optical potential in the plane perpendicular to wave propagating

## direction

We calculated the optical potential on 50nm gold particle in y-z plane by integrating the optical forces in y and z direction when the waveguide is in amorphous phase or crystalline phase supposing the plane is  $5\mu$ m from the light source. The z=0 axis is top surface of the waveguide. It could be seen from the figure that a large potential well of around 50 kT and 10 kT appears at the position where the gold particle is placed in our *manuscript* for amorphous and crystalline phase GST at the incident power of 15mW and 30mW respectively. Such high potential well will be able to trap the particle from escaping to the surrounding solution.



Figure 1. Calculated optical potential on 50nm gold particle in y-z plane above the waveguide for (a) amorphous phase and (b) crystalline phase GST.