An Introduction to ghost imagine: quantum and classical

Chen Huang

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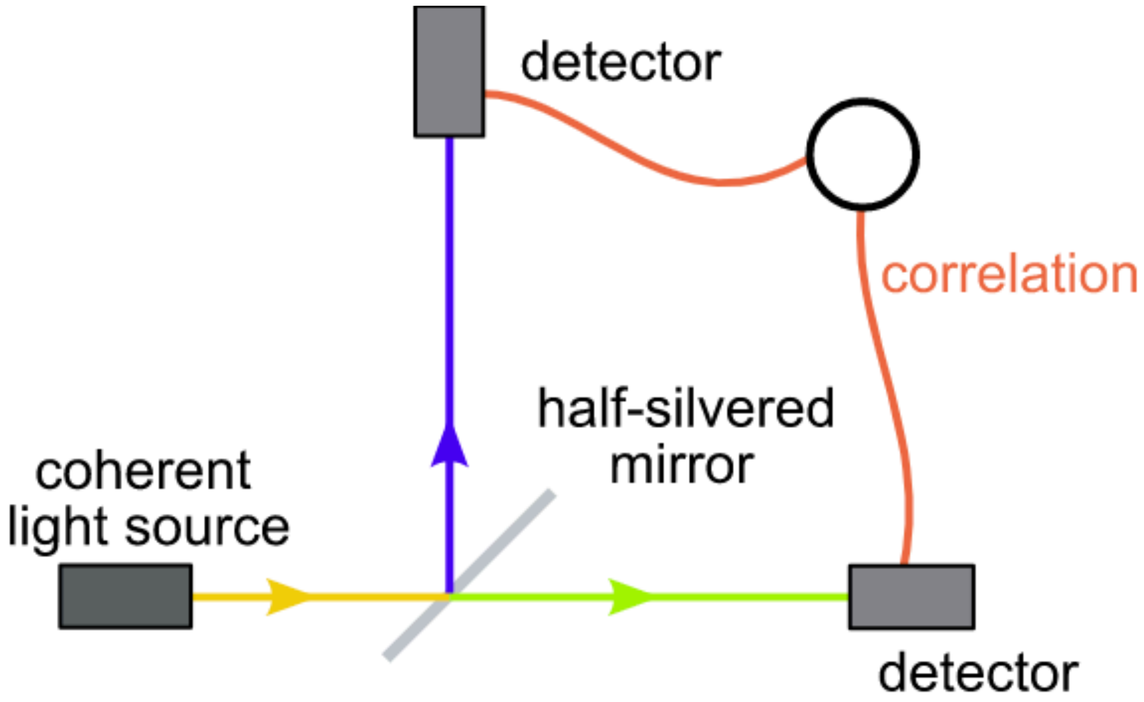
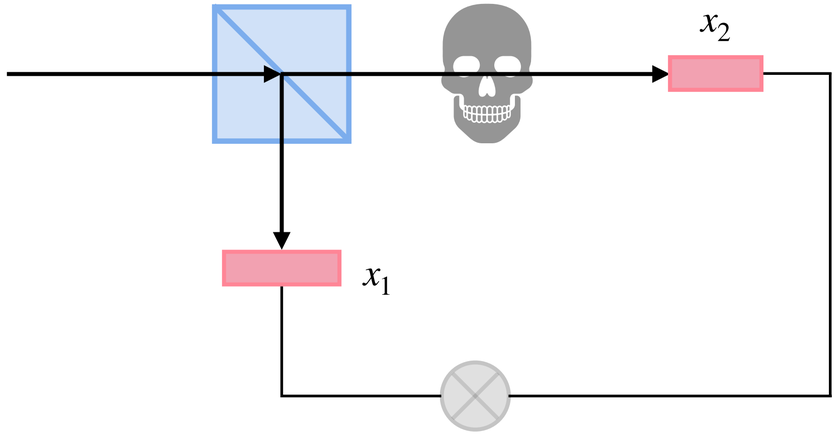
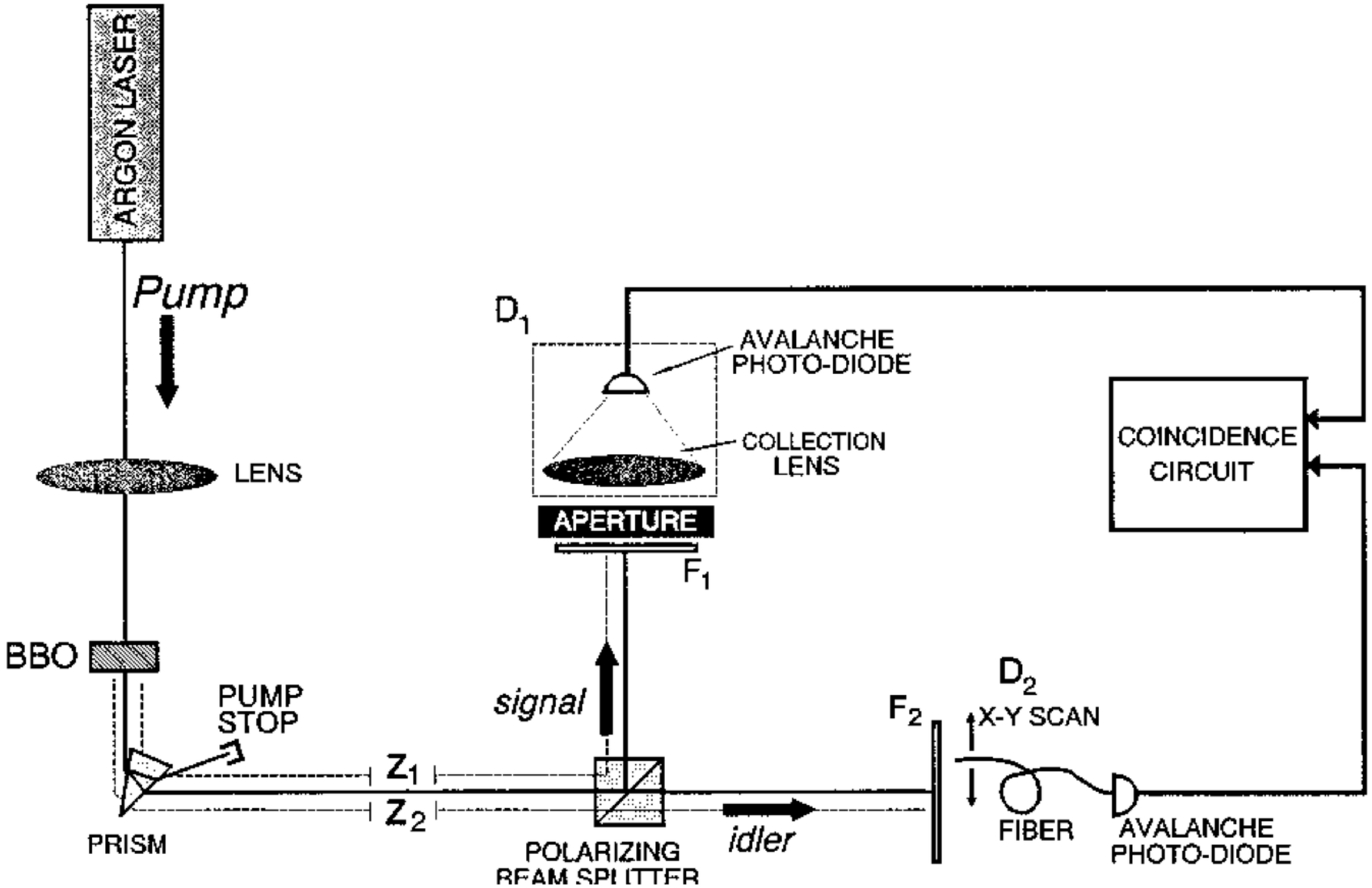
HBT ➡ Ghost image

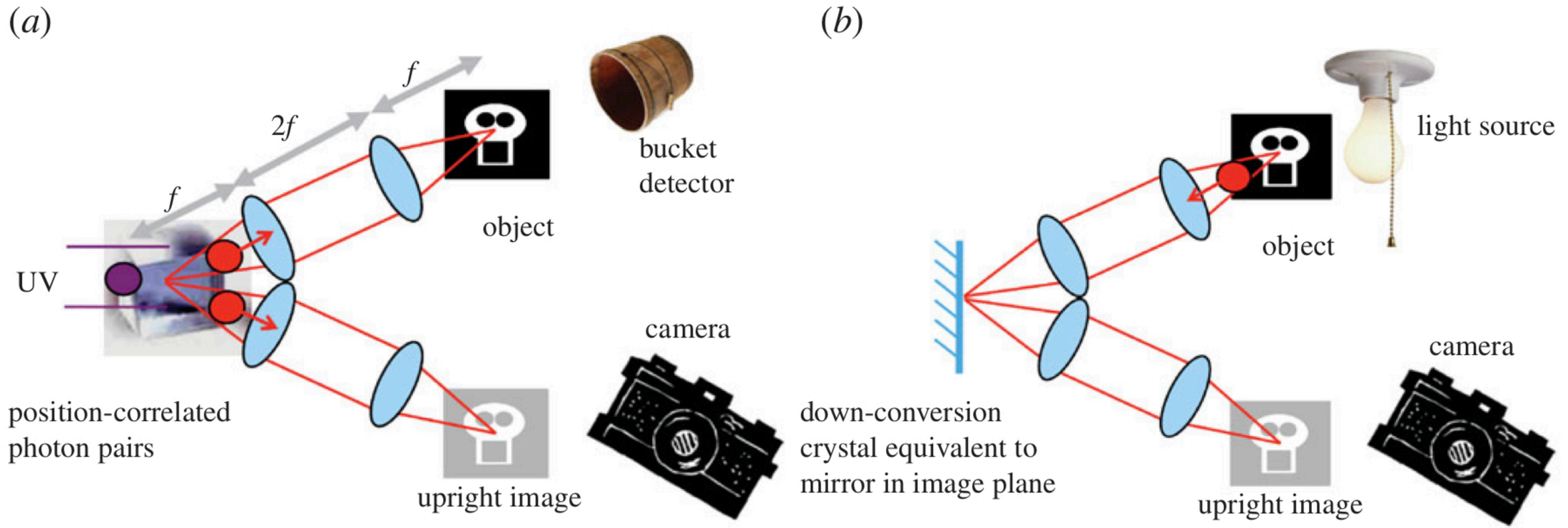


$$\langle I(\vec{r}_1, t_1) I(\vec{r}_2, t_2) \rangle$$


x_2
x_1
$G^{(2)}(x_1, x_2)$


ARGON LASER
Pump
LENS
BBO
PUMP STOP
PRISM
Z_1
Z_2
signal
idler
POLARIZING BEAM SPLITTER
D_1
AVALANCHE PHOTO-DIODE
COLLECTION LENS
APERTURE
F_1
F_2
D_2
X-Y SCAN
FIBER
AVALANCHE PHOTO-DIODE
COINCIDENCE CIRCUIT

Klyshko model



The images produced by a ghost imaging system (a) based on spontaneous parametric down-conversion (SPDC) are equivalent to those that could be produced by a classical imaging system (b), albeit the ghost imaging system has a diferent time sequence of events.

（1）换不同的光源来做，从量子纠缠光源到经典热光源，从波长最短的X射线到红外线;

（2）想把鬼成像尽快用于实际，但是必须解决成像积分时间长，并且成像质量不高的问题。

Computational ghost imaging

Single-pixel imaging

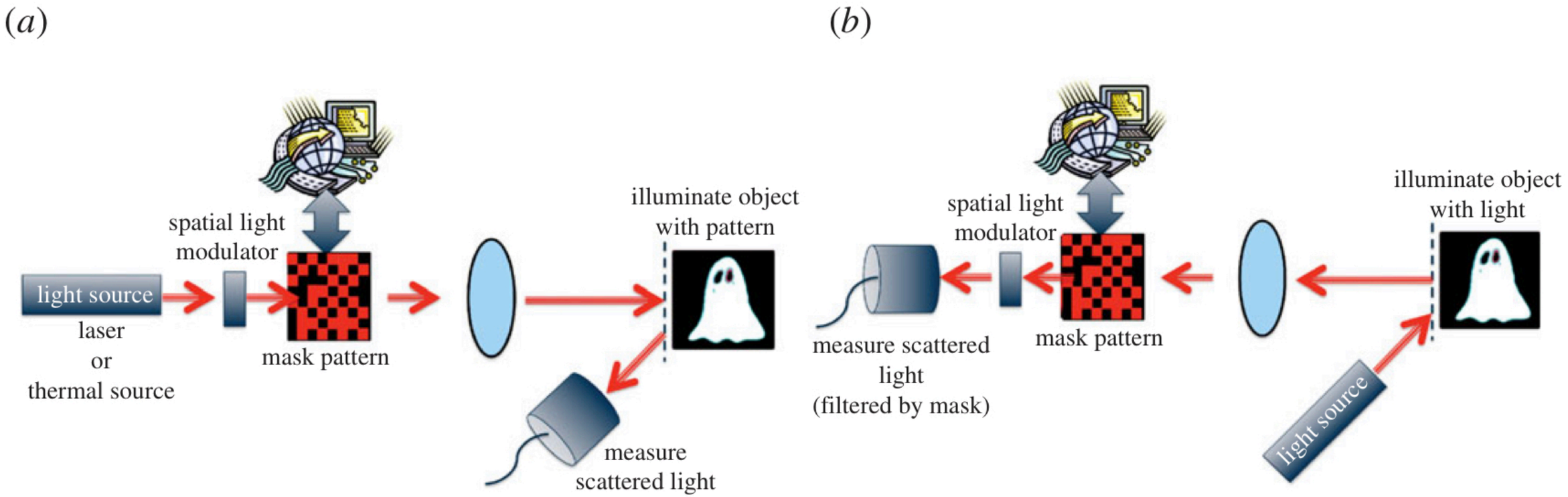
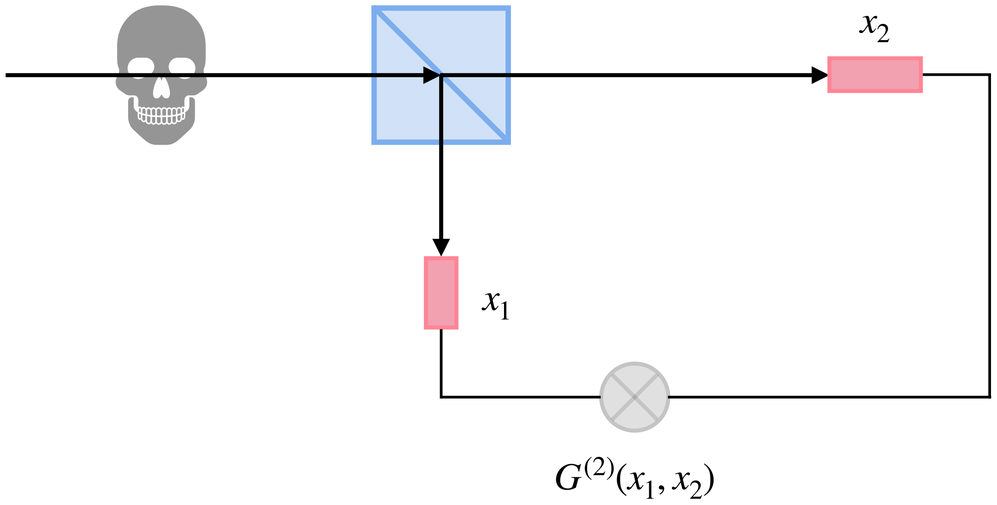
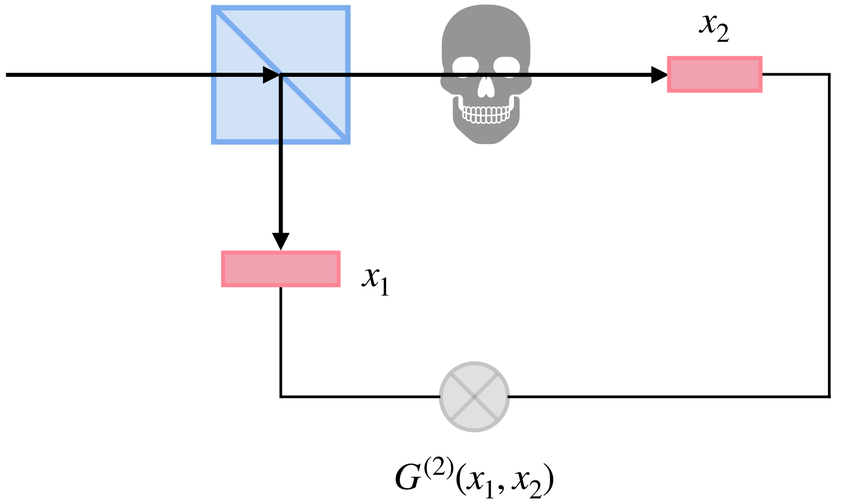


Figure 4. Computational ghost imaging (*a*) and single-pixel cameras (*b*) are similar in that they both reconstruct an image of the object from correlation measurements between the unknown object and the known masks.

自关联HBT



互关联HBT（鬼成像）



Klyshko模型