

ABSTRACT OF THE DISCLOSURE

The present invention relates to a beam controller based on an optical phased array. The beam controller comprises an optical phased array, a free-space beam combining area, and a shared grating transmitter. The optical phased array comprises: a beam splitter and a waveguide array
5 coupled to the beam splitter. The beam splitter is configured to equally split an initial light beam into a plurality of sub-beams. The waveguide array comprises: a plurality of waveguides arranged in one-to-one correspondence to the sub-beams. The waveguides are configured to receive and transmit the sub-beams. Transmission tail sections of the plurality of waveguides are concentrated in the free-space beam combining area in a fan shape manner. The free-space beam
10 combining area is configured to: enable the plurality of sub-beams to be combined on an image plane. The shared grating transmitter is configured to: diffract and transmit a combined light beam that the plurality of sub-beams are combined on the image plane. The beam controller can control the combined light beam to have higher scan output efficiency while achieving large-angle emission.

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