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(54) Title: MULTIPLE-INPUT METHOD AND APPARATUS OF FREE-SPACE OPTICAL COMMUNICATION

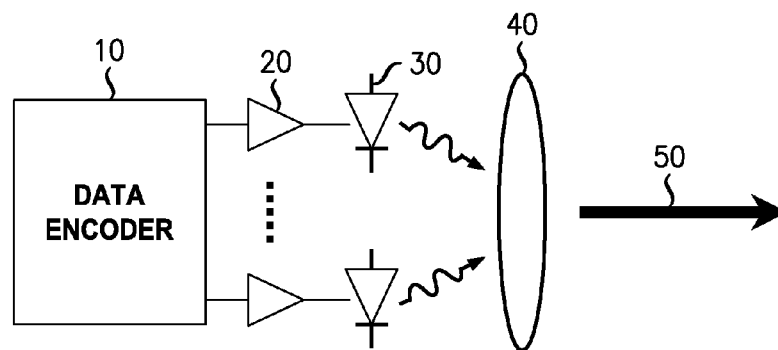


FIG. 1

(57) Abstract: An approach is provided that uses diversity to compensate fading of free-space optical (FSO) signals propagating through an environment characterized by atmospheric scintillation. One embodiment involves collecting at least one FSO beam, demultiplexing the beam by wavelength into at least two sub-beams, detecting each sub-beam to produce an electrical output therefrom, and recovering a signal using complementary information from at least two of the electrical outputs. Another embodiment involves collecting the FSO beam onto an array of spatially separated sub-apertures, detecting the light entering each sub-aperture to produce an electrical output therefrom, and recovering a signal using complementary information from at least two of the electrical outputs. This second embodiment enables both electronic adaptive processing to coherently integrate across the sub-apertures and in the case of multiple transmit apertures a free space optical Multiple Input Multiple Output (MIMO) system.