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(54) Title: SYSTEM AND METHODS FOR WIRELESS BROADBAND DELIVERY OF DATA

(57) Abstract: A system and method for wireless data delivery is provided. The communication may be between the antenna arrays of an airborne platform (such as aircraft) and a surface base station. The antenna arrays may generate a plurality of directional synchronization beams directed in at a plurality of corresponding spatial directions. Other antenna arrays receive the directional synchronization beam and respond in kind, providing the original antenna array a way to determine directionality of the other antenna arrays. The antenna arrays may then receive a training beam. The training beam includes known data, such as a Fourier Matrix, which may then be utilized to generate weights. Weights may then be utilized to modify either of the phase or amplitude of a base signal which is then sent to each of the elements of the antenna array in order to achieve directionality of the signal propagation. Thus, a directional beam may be formed which is oriented toward the source of the training beam, which may be a base station or the like. It may also be desirable to identify sources of interference. Interference sources are all non-desired sources of radiation within the target frequency range. Lastly, the system may steer one or more nulls in order to substantially attenuate the sources of interference.

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