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(54) **WEATHER-RESILIENT COUNTERMEASURES FOR LINE-OF-SIGHT MULTIPLE-INPUT MULTIPLE-OUTPUT FEEDER LINKS IN MULTIBEAM SATELLITE SYSTEMS**

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(57) **ABSTRACT**

A system and method for providing multi-input multi-output (MIMO) feeder links for a multibeam satellite system. The method includes configuring a X×Y MIMO antenna system using X-antennae having dominant line-of-sight (LoS) of Y-antennae; transmitting, simultaneously, a Tx signal as X Tx signals on a MIMO channel with the X-antennae; receiving the X Tx signals on the MIMO channel with the Y-antennae as Y Rx signals, wherein each of the Y-antennae generate one of the Y Rx signals; and ground-interference processing the X Tx signals or the Y Rx signals to recover the Tx signal; satellite-interference processing the X Tx signals or the Y Rx signals to recover the Tx signal. In the method, the ground interference processing includes countermeasures as either pre-interference processing when the X-antennae are disposed on a ground or post-interference processing when the X-antennae are disposed in a Geosynchronous orbit satellite. Gateway diversity for multiple MIMO feeder links utilizing these countermeasures improves weather-resiliency and significantly enhances overall satellite network availability.