US 20230231588A1

(54) **MULTIPATH SUPPRESSION METHOD BASED ON STEEPEST DESCENT METHOD**

(71) Applicant: **NANJING UNIVERSITY OF AERONAUTICS AND ASTRONAUTICS**, Nanjing (CN)

(72) Inventors: **Qinghua ZENG**, Nanjing (CN); **Wenqi QIU**, Nanjing (CN); **Jianye LIU**, Nanjing (CN); **Rui XU**, Nanjing (CN); **Yongrong SUN**, Nanjing (CN); **Rongbing LI**, Nanjing (CN); **Pin LYU**, Nanjing (CN); **Wei ZHAO**, Nanjing (CN); **Zhi XIONG**, Nanjing (CN); **Jizhou LAI**, Nanjing (CN)

Publication Classification

(57) **ABSTRACT**

A multipath suppression method based on a steepest descent method includes stripping, according to carrier Doppler shift information fed back by a phase-locked loop, a carrier from an intermediate-frequency signal input into a tracking loop; constructing, on the basis of the autocorrelation characteristics of a ranging code, a quadratic cost function related to a measurement deviation of the ranging code, the cost function being not affected by a multipath signal; and finally, designing a new tracking loop of the ranging code according to the quadratic cost function and the principle of the steepest descent method, such that the loop has a multipath suppression function without increasing the computational burden. Compared with a narrow-distance correlation method, the current method reduces computing resources by $\frac{1}{3}$, the design and adjustment of parameters are simple and feasible, a multipath suppression effect is superior, and a high engineering application value is obtained.