Claims

1. A method for automatically tracking a satellite, comprising:

determining geographic location information of an automatic tracking satellite dish and an azimuth angle of a line between two global navigation satellite system (GNSS) antennas according to radio frequency signals of the two GNSS antennas;

determining a current azimuth angle of a main lobe of the automatic tracking satellite dish according to the azimuth angle of the line between the two GNSS antennas;

determining a current elevation angle of the main lobe of the automatic tracking satellite dish; and

adjusting the main lobe of the automatic tracking satellite dish to point to a target satellite to be tracked according to location information of the target satellite to be tracked, the geographic location information, the current azimuth angle, and the current elevation angle;

wherein determining the current azimuth angle of the main lobe of the automatic tracking satellite dish according to the azimuth angle of the line between the two GNSS antennas comprises:

determining the current azimuth angle of the main lobe of the automatic tracking satellite dish according to a preset rotation direction, a preset rotation angle, and the azimuth angle of the line between the two GNSS antennas.

2. The method according to claim 1, wherein adjusting the main lobe of the automatic tracking satellite dish to point to the target satellite to be tracked according to the location information of the target satellite to be tracked, the geographic location information, the current azimuth angle, and the current elevation angle comprises:

calculating, according to the location information of the target satellite to be tracked, the geographic location information, the current azimuth angle, and the current elevation angle, a target azimuth angle of the main lobe of the automatic tracking satellite dish and a target elevation angle of the main lobe of the automatic tracking satellite dish when the main lobe of the automatic tracking satellite dish points to the target satellite; and

adjusting the main lobe of the automatic tracking satellite dish to point to the target satellite according to the target azimuth angle and the target elevation angle.

3. The method according to claim 1, wherein determining the geographic location information of the automatic tracking satellite dish and the azimuth angle of the line between the two GNSS antennas according to the radio frequency signals of the two GNSS antennas comprises:

determining the geographic location information of the automatic tracking satellite dish and the azimuth angle of the line between the two GNSS antennas according to the radio frequency signals of the two GNSS antennas by using a carrier phase differential technique.

4. The method according to claim 1, wherein determining the current elevation angle of the main lobe of the automatic tracking satellite dish comprises:

determining the current elevation angle of the main lobe of the automatic tracking satellite dish according to an initial elevation position of the main lobe of the automatic tracking satellite dish or according to data information collected by an internal component of the automatic tracking satellite dish.

5. The method according to claim 1, after adjusting the main lobe of the automatic tracking satellite dish to point to the target satellite to be tracked according to the location information of the target satellite to be tracked, the geographic location information, the current azimuth angle, and the current elevation angle, further comprising:

searching for a signal strength of the target satellite within a preset range and adjusting the main lobe of the automatic tracking satellite dish to point at an azimuth angle corresponding to a highest signal strength of the target satellite and an elevation angle corresponding to the highest signal strength of the target satellite.

6. The method according to claim 1, after adjusting the main lobe of the automatic tracking satellite dish to point to the target satellite to be tracked according to the location information of the target satellite to be tracked, the geographic location information, the current azimuth angle, and the current elevation angle, further comprising:

determining whether the main lobe of the automatic tracking satellite dish points to the target satellite according to a signal strength of the target satellite and a signal quality of the target satellite that are found within a preset time range after an orientation of the main lobe of the automatic tracking satellite dish is adjusted.

7. The method according to any one of claims 1 to 6, wherein

a projection of the line between the two GNSS antennas on a horizontal plane is perpendicular to the main lobe of the automatic tracking satellite dish; and

a length of the projection of the line between the two GNSS antennas on the horizontal plane is greater than a preset distance.

8. An apparatus for automatically tracking a satellite, comprising:

a first angle determination module, which is configured to determine geographic location information of an automatic tracking satellite dish and an azimuth angle of a line between two global navigation satellite system (GNSS) antennas according to radio frequency signals of the two GNSS antennas;

a second angle determination module, which is configured to determine a current azimuth angle of a main lobe of the automatic tracking satellite dish according to the azimuth angle of the line between the two GNSS antennas;

a third angle determination module, which is configured to determine a current elevation angle of the main lobe of the automatic tracking satellite dish; and

an adjustment module, which is configured to adjust the main lobe of the automatic tracking satellite dish to point to a target satellite to be tracked according to location information of the target satellite to be tracked, the geographic location information, the current azimuth angle, and the current elevation angle;

the second angle determination module is further configured to determine the current azimuth angle of the main lobe of the automatic tracking satellite dish according to a preset rotation direction, a preset rotation angle, and the azimuth angle of the line between the two GNSS antennas.

9. An electronic device, comprising:

at least one processor; and

a storage apparatus, which is configured to store at least one program;

wherein the at least one program is executed by the at least one processor to cause the at least one processor to perform the method for automatically tracking a satellite according to any one of claims 1 to 7.

10. A computer-readable storage medium, which is configured to store a computer program, wherein the computer program, when executed by a processor, implements the method for automatically tracking a satellite according to any one of claims 1 to 7.