

## WHAT IS CLAIMED IS:

1. An impedance matching method for a pulsed RF power supply, comprising:

a coarse adjustment step: performing adjustment based on a current load impedance to make a current reflection coefficient  $|\Gamma|$  no greater than an ignition reflection coefficient  $|\Gamma_t|$ , and setting a current position to be an ignition position;

a fine adjustment step: keeping the ignition position to be unchanged, performing adjustment in real time based on the current load impedance to realize impedance matching, and setting the current position to be a matching position; and

a switching step: switching between the ignition position and the matching position in different pulse time durations of each subsequent pulse period after impedance matching is realized for a first time, thereby realizing impedance matching in different pulse periods.

2. The impedance matching method according to claim 1, wherein the impedance matching method comprises:

Step 1: determining, in real time, whether or not the current reflection coefficient  $|\Gamma|$  is no greater than the ignition reflection coefficient  $|\Gamma_t|$ ; if the current reflection coefficient  $|\Gamma|$  is determined to be greater than the ignition reflection coefficient  $|\Gamma_t|$ , Step 2 is executed, otherwise, the fine adjustment step is executed; and

Step 2: performing the coarse adjustment step in real time based on the current load impedance, and returning to Step 1.

3. The impedance matching method according to claim 1, wherein before the coarse adjusting step, the method further comprises:

determining whether or not a current moment is in a high voltage level period of a pulse period when matching has not been realized; if the current moment is determined to be in the high voltage level period of the pulse period when matching has not been realized, executing the coarse adjustment step; otherwise, maintaining

the current position to be unchanged.

4. The impedance matching method according to claim 3, wherein when the current moment is determined to be in the high voltage level period of the pulse period when the matching has not been realized, the pulsed RF power supply uses a frequency-sweep mode to perform automatic impedance matching.

5. The impedance matching method according to claim 1, wherein the fine adjustment step further comprises:

storing the matching position when impedance matching is realized.

6. The impedance matching method according to claim 1, wherein the switching step comprises:

after impedance matching is realized for the first time, switching from the ignition position to the matching position in a high voltage level period of each subsequent pulse period, and switching from the matching position to the ignition position in a low voltage level period of each subsequent pulse period.

7. An impedance matching device for a pulsed RF power supply configured to match a load impedance of the pulsed RF power supply with a characteristic impedance of the pulsed RF power supply, wherein the device comprises a coarse adjusting unit, a fine adjusting unit, and a switching unit, wherein:

the coarse adjusting unit is configured to adjust, based on a current load impedance, a current reflection coefficient  $|\Gamma|$  to be no greater than an ignition reflection coefficient  $|\Gamma_t|$ , and set a current position as a ignition position;

the fine adjusting unit is configured to maintain the ignition position to be unchanged when the current reflection coefficient  $|\Gamma|$  is no greater than the ignition reflection coefficient  $|\Gamma_t|$ , perform adjustment in real time based on the current load impedance to realize impedance matching, and set a current position as a matching position; and