tuning range. The discrepancy between simulated frequency and measured frequency is below 500 kHz, which is also within the range of tuning.

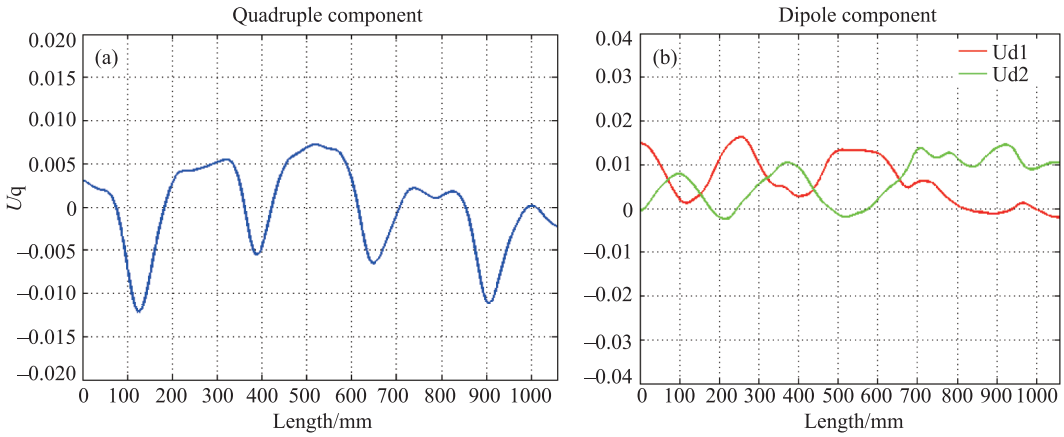

Fig. 5 (color online) The flatness and asymmetry.

6 - 8 Electropolishing of Niobium from Choline Chloride Based Ionic Liquid

Chu Qingwei, He Yuan, Zhang Shenghu, You Zhiming, Guo Hao and Xiong Pingran

The BCP solutions use mixed acids based on HF acid, which carry significant potential safety hazard during operation. Developing a safe and green polishing solution without HF is an important research subject for cavity's surface treatment[1]. We adopt green ionic liquids for polishing solution of electropolish niobium samples.

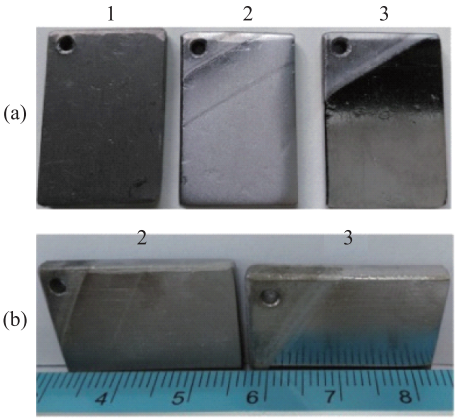

Fig. 1 (color online) Pictures of Nb samples: (1#) without any treatment; (2#) electropolished at 50 ℃, 20 min, −5 V; (3#) 80 ℃, 20 min, −5 V.

In the experiment, niobium samples were electropolished from a 1:2:1 Choline chloride–urea-ammonium fluoride ionic liquid under different conditions (Fig. 1). The surface of Nb sample without any treatment is dark and uneven (1# of Fig. 1). After electropolished at 50 ℃, the surface of Nb sample become smooth, but the glossiness is not good (2# of Fig. 1). Improving the electropolishing temperature to 80 ℃, the glossiness of Nb becomes good and the surface becomes even (3# of Fig. 1). In order to compare the electropolishing effect intuitively, put a ruler before the treated samples. Sample 3# has a certain mirror effect, but sample 2# does not. A smoother and better glossiness Nb can be achieved from choline chloride based under properly controlled conditions.

Reference

[1] A. I. Wixtrom, J. Buhler, C. E. Reece, et al, ECS Trans., 50(2012)199.