

압전형센서의 부착강도에 따른 비선형인자 측정 개선 연구 Improved measurement of acoustic nonlinearity parameter with different attachment force

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1. Breazeale, Gauster, Dace, Hurely 가

(A_1) 2 (A_2)

6~9um, Hurely 가

10~20nm

LiNbO₃, PZT, Fused silica

(Cu(100), Ti-6Al-4V) 가

2. Cu(100) Ti-6Al-4V 가

2.1 ω_1 ω_2 ω_2 ω_2

Fig.1 2f

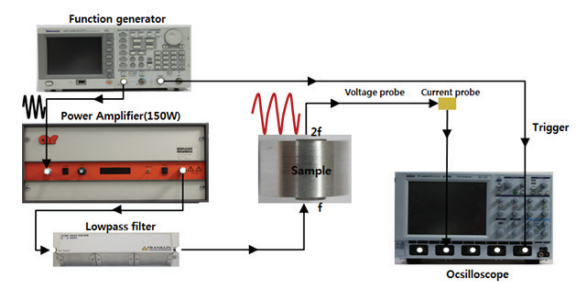


Fig. 1 Piezoelectric detection system for measuring nonlinearity parameter

Fig. 1 ω_1 ω_2

Fig. 2 ω_2 2f Q Pre-amp

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ω_2

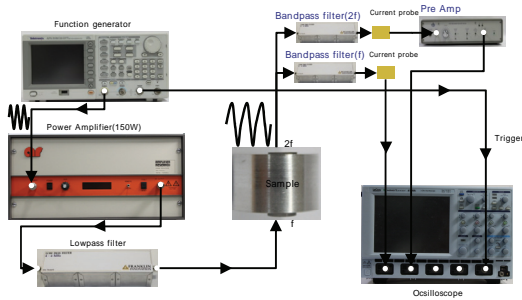


Fig. 2 Improved piezoelectric detection system for measuring nonlinearity parameter

2.2

$$I_{out}(\omega) \quad \omega_1 \quad \omega_2 \quad 2f$$

2f

$$|A_{inc}(\omega_1)| = |H(\omega)| |I_{out}(\omega_1)| \quad (1)$$

$$|A_{inc}(\omega_2)| = |H(\omega)| |I_{out}(\omega_2)| \quad (2)$$

(1) (2) ω_1 ω_2 가
Pre-amp (1) (2) , 2

2.3

Cu(100) Ti-6Al-4V

가 0.06g/mm 0.2g/mm 2
Fig. 3 4

Cu(100) Ti-6Al-4V
Fig. 3 4

가 , 가

0.2g/mm

Fig. 3 4

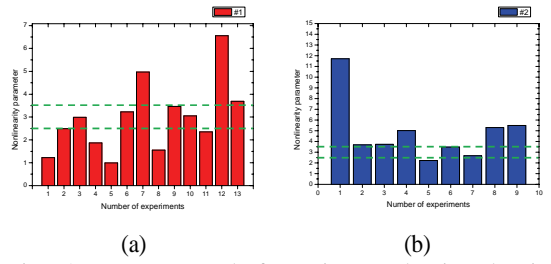


Fig. 3 β measured from improved piezoelectric detection for Cu(100) with different bonding condition (a) 0.06g/mm spring constant (b) 0.2g/mm spring constant

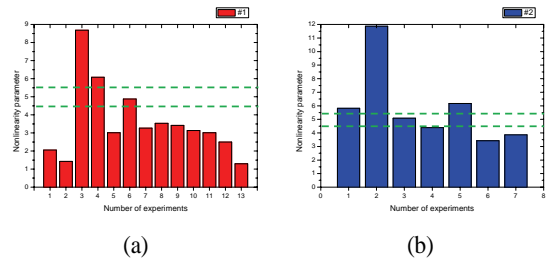


Fig. 4 β measured from improved piezoelectric detection for Ti-6Al-4V with different bonding condition (a) 0.06g/mm spring constant (b) 0.2g/mm spring constant

3.

Cu(100) Ti-6Al-4V

0.2g/mm

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