A comparison of spectral magnitude and phase-loc ing value analyses of the frequency-following response to complex tones

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T e e e e e (100 H), e e e e e e e e-e-e e e e e (FFR$_{EN}$), e e e e E e e 1 e e e e e e e e (PL). B e e FFR$_{EN}$ e e e e e e e e e e e e e e . A e e e e e e H e e , PL e e e e e e e e M e e e e e e e e , PL e e e e e e e . H e e e e e PL e e e e e e e e e e e FFR$_{EN}$, e e e e e e 100 H (E e e 2). R e e FFR$_{EN}$ e e e e e e e e e e e e e e e e e e . T e e e e e e PL e FFR$_{EN}$.

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P e : 384 395

I. INTRODUCTION

T e e e (FFR), e e e e e e e e e e e e e e e e ., K , 1999; G et al., 2000; K N , 2005; A et al., 2008; D et al., 2011). M e e FFR e e e e e e e e e (FFR$_{EN}$; e e e e e e e e e e), e e -e e e e e e) e e e e e FFR$_{EN}$., e e P , 2011). T e e FFREN e e e e e e e e e e e e ., K et al., 2010; B , 2007; B et al., 2008; C P , 2011; e e H , 1980; K et al., 2012; R et al., 2011; R et al., 2012). T e e e e e e e e e e FFR$_{EN}$.

M e e e e e e e e e e e FFR$_{EN}$ e

[illegible]

C. Equipment

[illegible] (S[illegible] 3[illegible]) [illegible] D/A [illegible]; T[illegible] D[illegible] T[illegible], G[illegible], FL) [illegible] (ER-1, E[illegible], E[illegible] G[illegible], IL) [illegible]

FFR$_{EN}$ [illegible] B[illegible] S[illegible] A[illegible] T[illegible] S[illegible] (B[illegible] S[illegible], A[illegible], N[illegible]) [illegible] 16.384 kH[illegible]. A[illegible] B[illegible] S[illegible] [illegible] A[illegible]-A[illegible] C[illegible]. T[illegible] FFR$_{EN}$ [illegible] C[illegible] [illegible], EOG) [illegible]. P[illegible] [illegible] <20 [illegible].

D. Procedures

A[illegible] (E[illegible] C-14 [illegible], C[illegible], MA). T[illegible]

E[illegible] E[illegible] 1 [illegible] ~2 [illegible] E[illegible] 1 [illegible] 4000 [illegible]. T[illegible] 8 [illegible] 1000 [illegible] (). S[illegible] 2000 [illegible] (, 2000 [illegible] 2 [illegible] 2 [illegible]).

E[illegible] E[illegible] 2 [illegible] ([illegible] ~1.5 [illegible]. T[illegible] (LO[illegible], MID, HIGH, BROAD, [illegible]) 2000

Te f e e e PL e e
e I f e ,
e e e . Te e e e e e e e -
e e ee e PL e . I e ,
FFR_{EN}

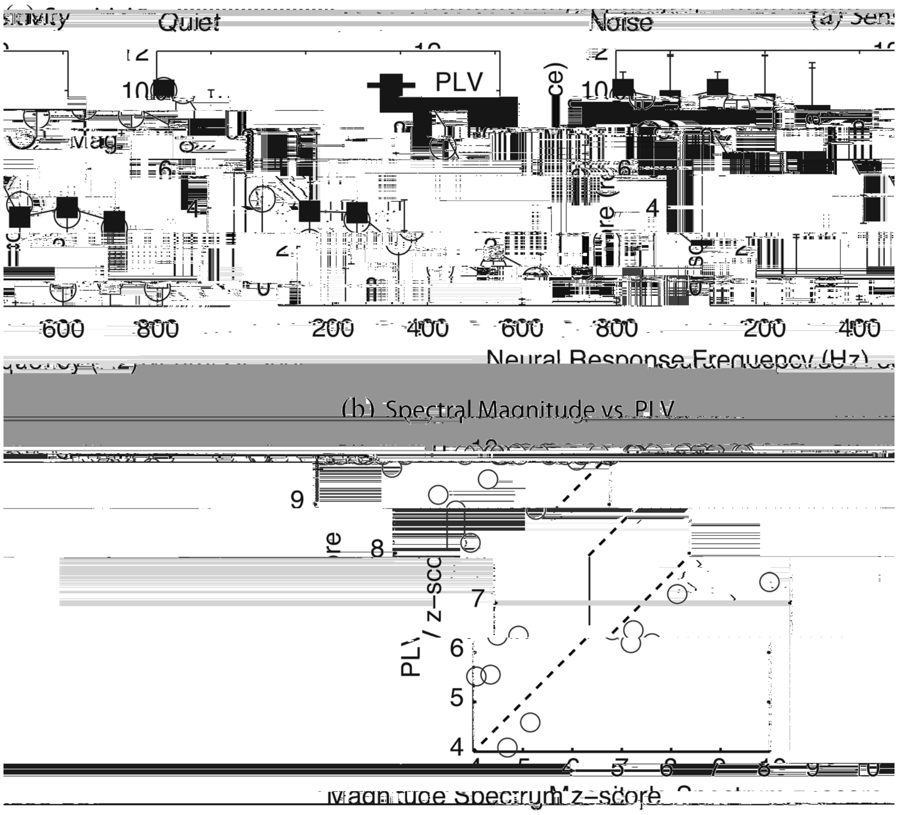

FIG. 4. C ... f PL ... (E ... 1). ( ) A ... PL ( ) ... ( ) z- ...). E ... . ( ) T ... PL ... z- ... f z- ... f 4, ... F ... , PL z- ... z- ...

... PL ... 16 ... f FFR$_{EN}$ 100 H ,f ... ; ... PL ... (ee T I).

T ... PL ... FFR$_{EN}$ ... T ... f ... PL ...

... PL (PL ... PL ... ; ...). A ee T II, ... FFR$_{EN}$ ... f 200,300, ,800. H ... PL 100 H .

TABLE I. C ... (B SNR) PL ... E ... f ... T ... PL ... ;

4. Statistical effects of additive acoustic noise

T ... PL . F ... FFR$_{EN}$ ... (T ' *post hoc* ; 100, 200, 300, 400, 500 H), ... (PL ... PL). ... (600, 700, 800 H);f ... ,

TABLE II. [illegible] F_0 [illegible] 1. [illegible] PL[illegible] [illegible] FFR_{EN} [illegible] 200[illegible]800 H[illegible] [illegible]

H[illegible] (H[illegible])	C[illegible] PL[illegible]	S[illegible] p[illegible]
100	0.0103	0.7174
200	**+0.0623**	**0.0011**
300	**+0.0883**	**0.0004**
400	**+0.0756**	**0.0004**
500	**+0.0491**	**0.0009**
600	**+0.0191**	**0.0151**
700	**+0.0128**	**0.0097**
800	**+0.0070**	**0.0299**

B. Experiment 2

E[illegible] 2 [illegible] FFR_{EN} [illegible] 100 H[illegible]. F[illegible] 5 [illegible] PL[illegible] FFR_{EN} [illegible] ([illegible]).

A[illegible] E[illegible] 1, FFR_{EN} [illegible] F_0 [illegible] PL[illegible] PL[illegible]. T[illegible] FFR_{EN} [illegible] F_0 [illegible]

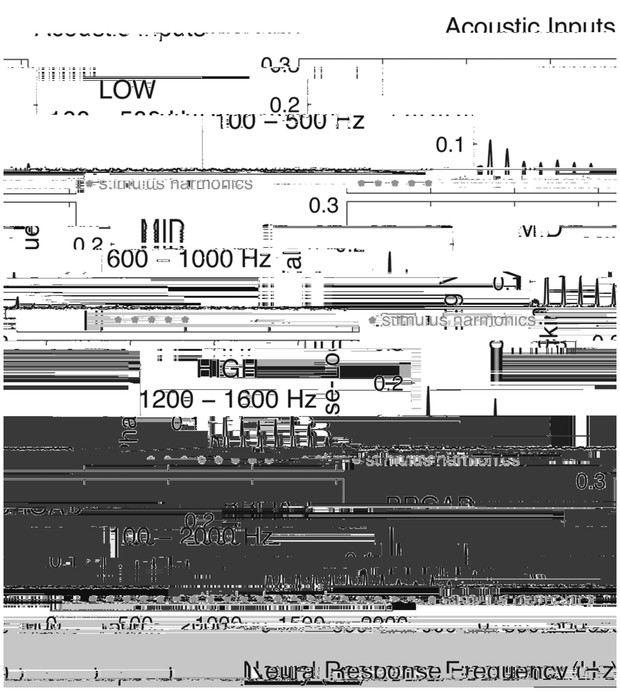

FIG. 5. P[illegible] 100 H[illegible] (E[illegible] 2). F[illegible] FFR [illegible] F_0 [illegible] F_0.

[illegible] LO[illegible].

T[illegible] FFR_{EN} [illegible] PL[illegible] 100 H[illegible] F[illegible] 6). T[illegible] LO [illegible] PL[illegible] MID, HIGH, [illegible] BROAD [illegible]. T[illegible] B[illegible] ($p < 0.05/6$ [illegible] 0.0083) [illegible]. T[illegible] ( ) [illegible] FFR_{EN} F_0 [illegible] LO [illegible] HIGH [illegible] BROAD [illegible] $t(1, 19)$ [illegible] 4.0, p [illegible] 0.001 [illegible] $t(1, 19)$ [illegible] 3.2, p [illegible] 0.005, [illegible] LO [illegible] MID [illegible] $t(1,19)$ [illegible] 2.9, p [illegible] 0.009, [illegible] B[illegible] ( ), [illegible] PL[illegible] MID, HIGH, [illegible] BROAD [illegible] MID [illegible] HIGH: $t(1, 19)$ [illegible] 0.5, p [illegible] 0.632; MID [illegible] BROAD: $t(1, 19)$ [illegible] 0.6, p [illegible] 0.544; HIGH [illegible] BROAD: $t(1, 19)$ [illegible] 0.1, p [illegible] 0.891 .

IV. DISCUSSION

A. Advantages of PLV analysis

I[illegible], PL[illegible] FFR_{EN} [illegible] T[illegible] PL[illegible] (EEG) [illegible]

FIG. 6. P[illegible] 100 H[illegible]. T[illegible] LO [illegible] FFR [illegible] 100 H[illegible] [illegible].

EEG (
), 65

LO . O

DC (P ,
1982). M
FFR$_{EN}$ A
FFR$_{EN}$ LO

4. Statistical significance of spectral magnitude results

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