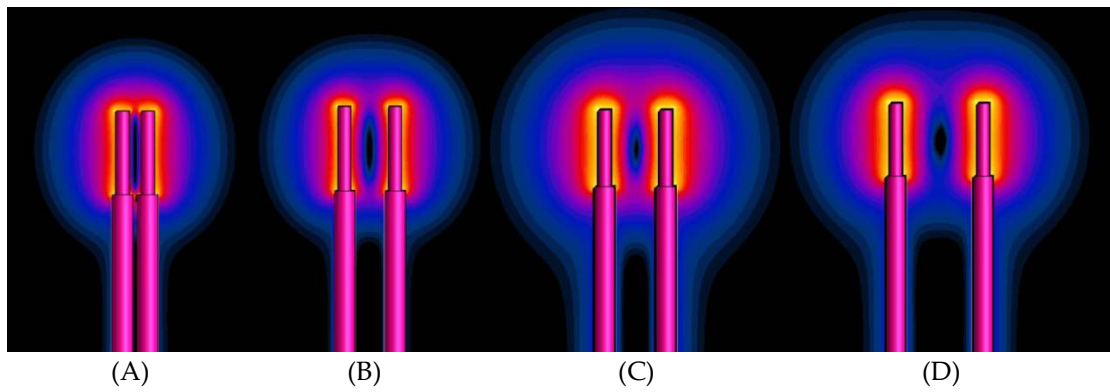**Table S1.** Uncertainty budget for the numerical calculation.

Source of Uncertainty	Tolerance [dB]	Probability Distribution	Divisor	Sensitivity Factor c_i	Standard Uncertainty [dB]
3D SAR distribution calculation					
ABC	0.04	N	1	1	0.04
Simulation Time	0.02	R	1.73	1	0.01
Grid Resolution	0.12	N	1	1	0.12
Volume Integral	0.6	N	1	1	0.60
Combined Standard Uncertainty					0.61
TF calculation					
ABC	0.04	N	1	1	0.04
Simulation Time	0.02	R	1.73	1	0.01
Grid Resolution	0.12	N	1	1	0.12
Placement of Excitation Source	0.35	R	1.73	1	0.20
Position of Calculation of Electrical Current	0.10	R	1.73	1	0.06
Combined Standard Uncertainty					0.25
A_{ij} factors calculation					
ABC	0.04	N	1	1	0.04
Simulation Time	0.02	R	1.73	1	0.01
Grid Resolution	0.10	N	1	1	0.10
Volume Integral	0.55	N	1	1	0.55
Combined Standard Uncertainty					0.56

Table S2. Combined uncertainty of the numerical calculation of the deposited power at a pair of leads.

Source of Uncertainty	Standard Uncertainty [dB]
3D SAR distribution calculation	0.61
TF calculation	0.25
A_{ij} factors calculation	0.56
Combined standard uncertainty (k=1)	0.86
Expanded uncertainty (k=2)	1.73

| (A) | (B) | (C) | (D) |

Figure S1. The SAR distribution at the tips of the pair of wires for l =0mm and (A) d=3mm, (B) d=6 mm, (C) d=8mm and (D) d=12 mm when they are excited by the electrical field shown in the first row of the Hadamard matrix.