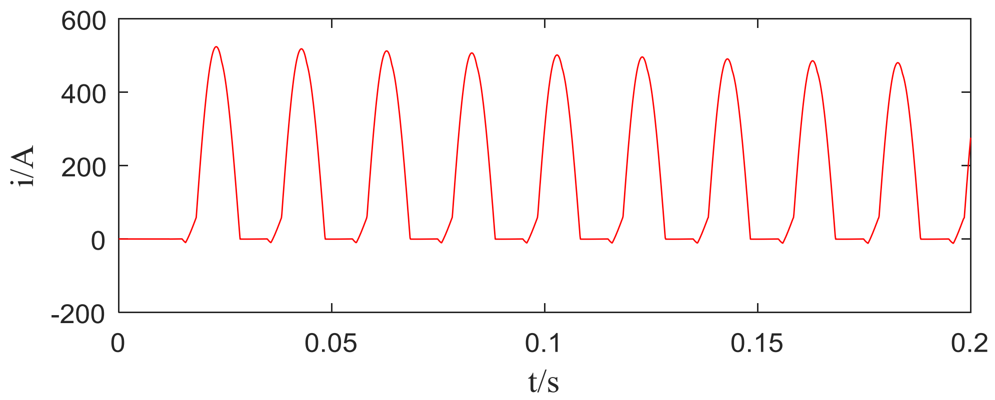
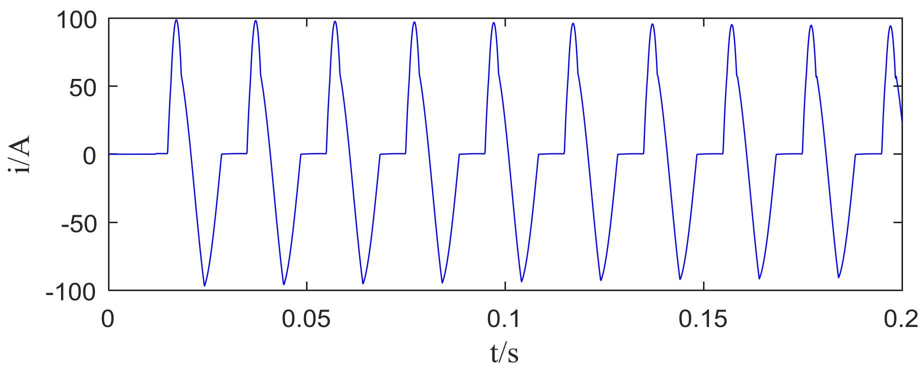
A NEW IDENTIFICATION METHOD OF THE TRANSFORMER INRUSH CURRENT BASED ON IMPROVED HILBERT-HUANG TRANSFORM ALGORITHM

UN NUEVO MÉTODO DE IDENTIFICACIÓN DE LA CORRIENTE DE ARRANQUE DEL TRANSFORMADOR BASADO EN UN ALGORITMO DE TRANSFORMACIÓN HILBERT-HUANG MEJORADO

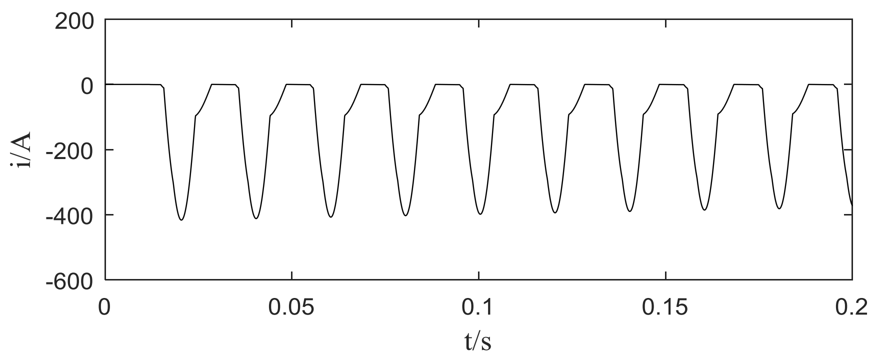
SUPPLEMENTARY MATERIAL



（a）



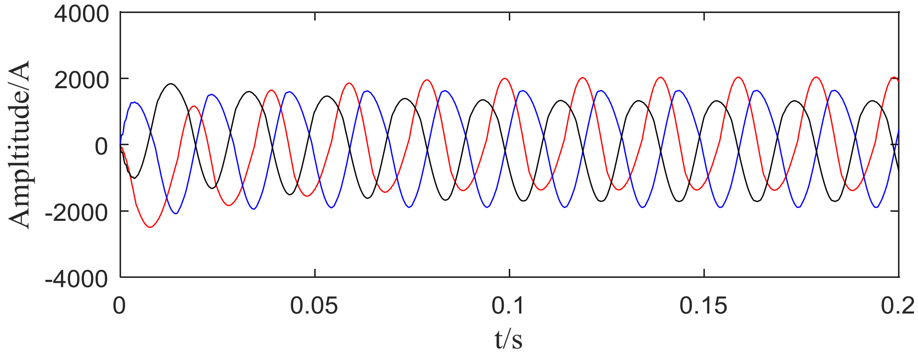
（b）



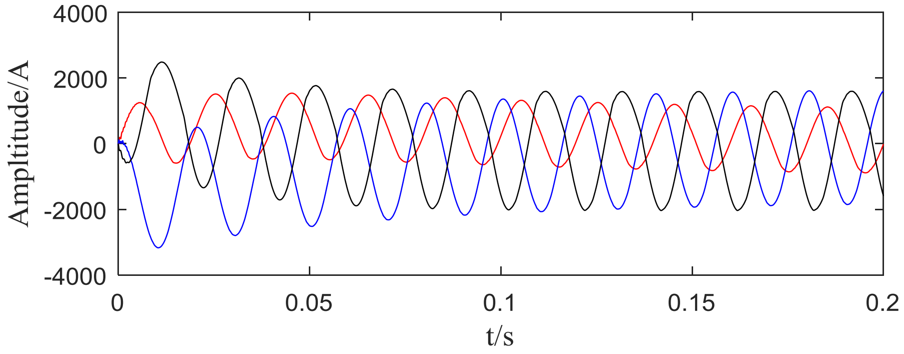
（c）

Fig.2. Waveform of three-phase inrush current.(a) A-phase inrush current. (b) B-phase inrush current. (c)

C-phase inrush current



（a）



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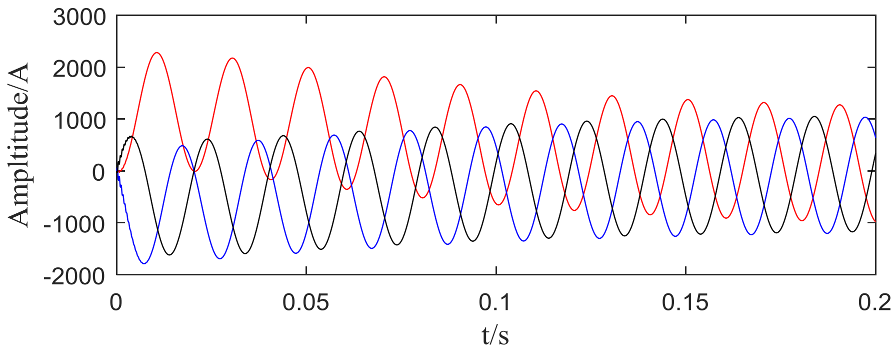
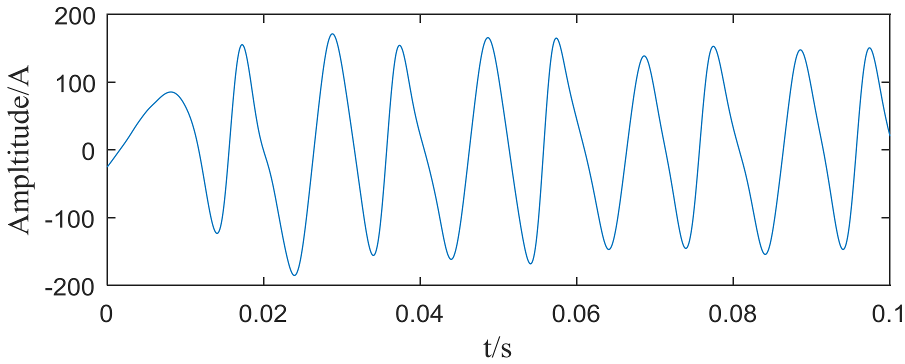
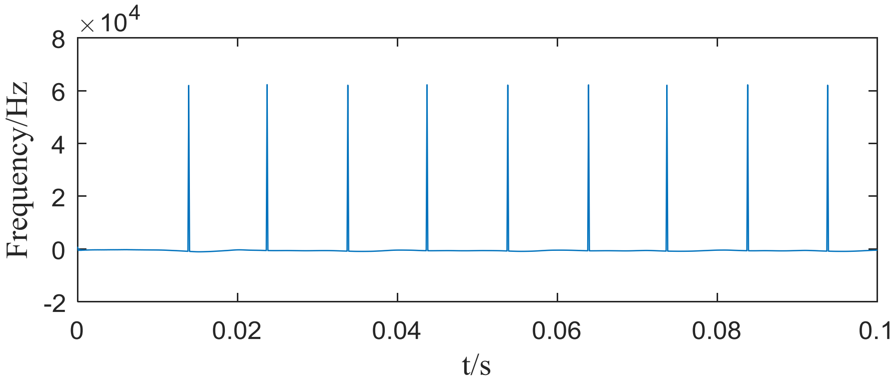


（c）

Fig.4. Waveform of internal fault current.
(a)Current of single-phase ground fault. (b) Current of inter-phase short circuit (c)Current of three-phase short circuit

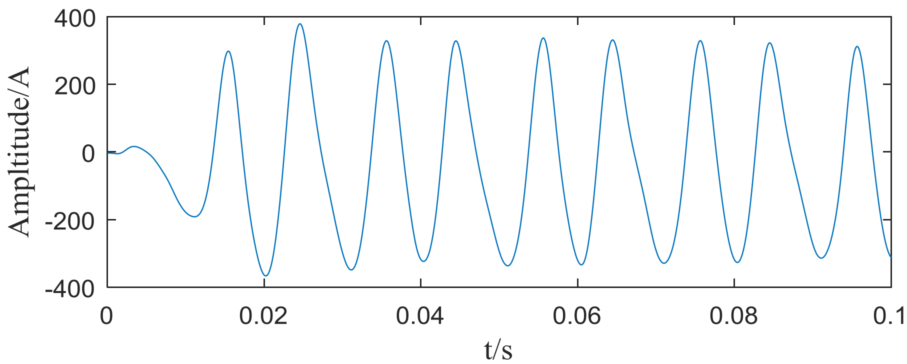


(a)

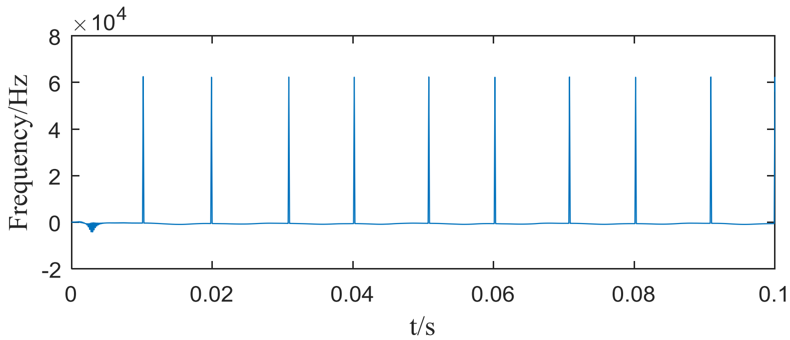


(b)

Fig.6. First IMF component obtained from B-phase inrush current and its instantaneous frequency. (a) First IMF component. (b) Instantaneous frequency

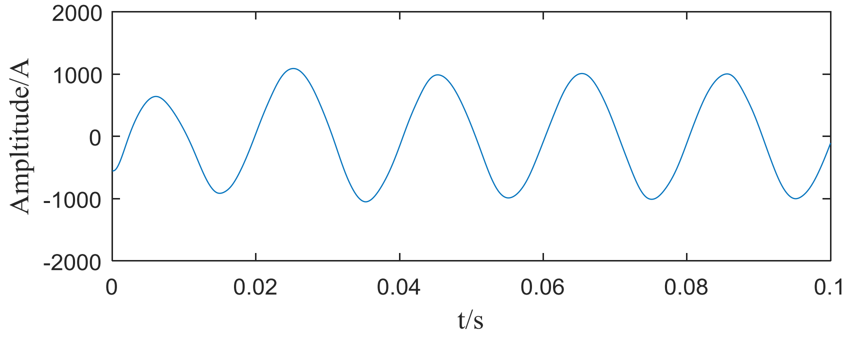


(a)

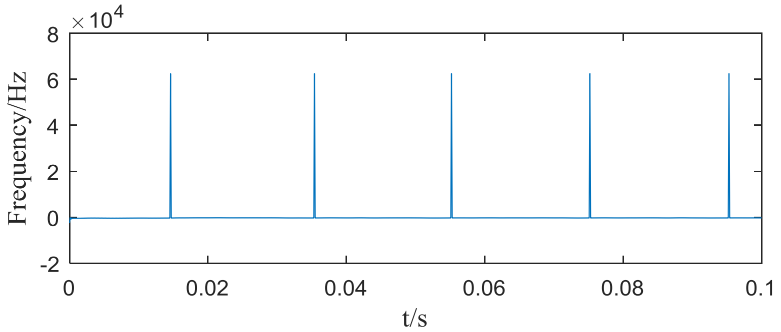


(b)

Fig.7. First IMF component obtained from C-phase inrush and its instantaneous frequency. (a) First IMF component. (b) Instantaneous frequency

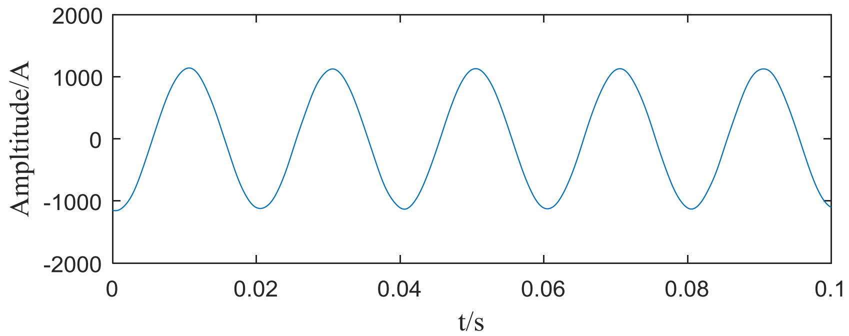


(a)

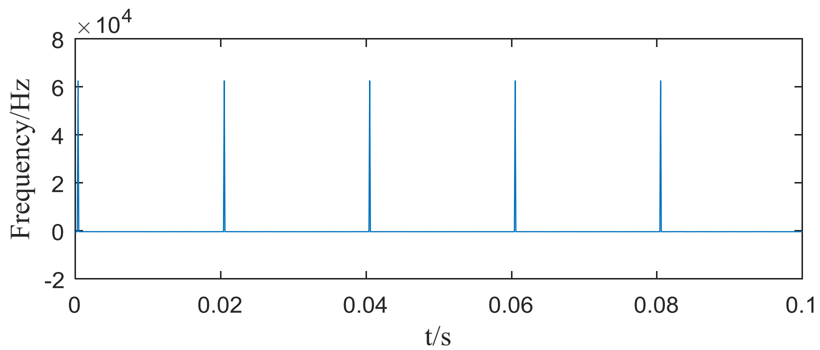


(b)

Fig.9. First IMF component and its instantaneous frequency obtained from inter-phase (A-B phase) short circuit. (a) First IMF component. (b) Instantaneous frequency



(a)



(b)

Fig.10. First IMF component obtained from three-phase short circuit t and its instantaneous frequency. (a) First IMF component. (b) Instantaneous frequency

Closing angle	Time intervals of catastrophe points in instantaneous frequency of A-phase (t/ms)	Time intervals of catastrophe points in instantaneous frequency of B-phase (t/ms)	Time intervals of catastrophe points in instantaneous frequency of C-phase (t/ms)
0°	5.3–8.7	7.7–12.2	4.6–9.1
60°	3.7–11.9	8.7–11.1	9.8–10.2
120°	9.4–11	5.3–11.5	7.2–12.2
180°	9.5–11.8	9.2–12.2	3.7–11.7
240°	5.7–9.5	4.4–12.3	9.5–10.8
300°	9.6–10.7	3.8–8.6	4.8–9.7

Table Ш. Time intervals of two adjacent catastrophe points in instantaneous frequency corresponding to inrush current in different closing phase angles