Influence of Inverter Excitation on Iron Loss of Non-Oriented Electrical Steel

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Abstract:

[illegible]

1. Introduction

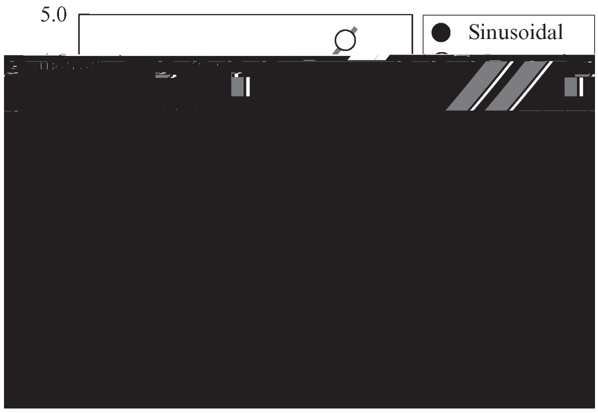
[illegible]

c an ed[7]. Y . . e c ed e   ece   a e a e   a PWM e e eed   d   en ON   a e   a   en e a , and e   ed   a   a   ed ced b dec ea   e   e e ON   a e[8]. Ba ed   e e e   , can be a d   a a de a ed   de and   e e   ca   e   e ce and   e ea   en   e   en   be ece a   en e a a   de PWM   e e e c a   c d   . T e e e, e

2.2 Experimental Results and Discussion

Figure 3 [illegible] B_m 1.5 T and [illegible] 50 Hz, and [illegible] 1.5 T, [illegible] 50 Hz, [illegible] 1 kHz and [illegible] 0.4. [illegible]

Figure 4 [illegible] B_m, [illegible] 1.5 T, 50 Hz and 0.4, [illegible]. **Figure 5** [illegible] [illegible] **Figure 6** [illegible] B_m, [illegible] 1.5 T, 50 Hz and 1 kHz, [illegible]. **Figure 7** [illegible] 1.6 [illegible].



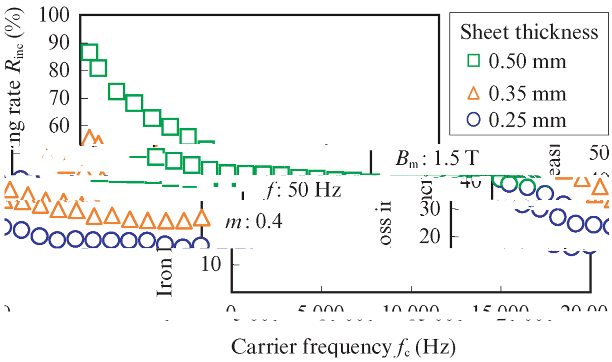


Fig. 5 Influence of carrier frequency on R_{inc}

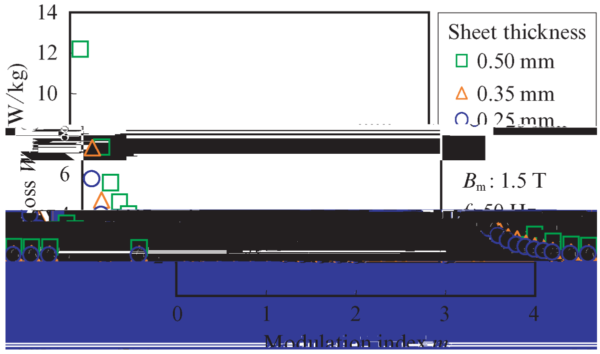


Fig. 6 Influence of modulation index on W_{inv}

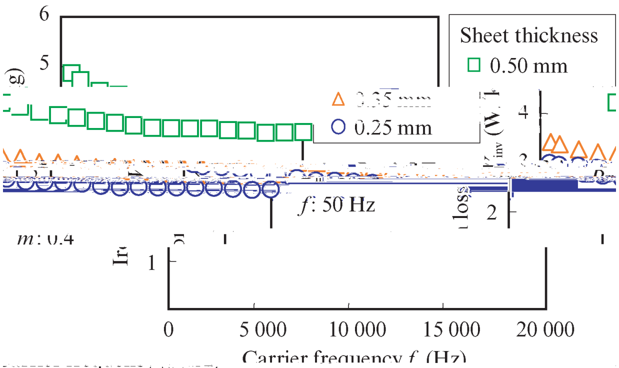


Fig. 4 Influence of carrier frequency on W_{inv}

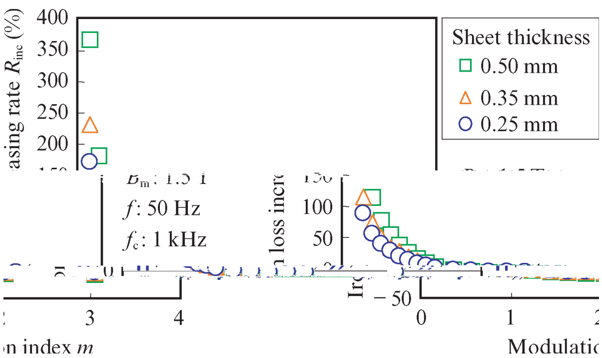


Fig. 7 Influence of modulation index on R_{inc}

Figure 8 e c ange n e engt e ag n e c ed ΔH a d 0 T and e c ange ag n e c den ΔB a n e e e c va n c n d n and ee c ne e. A e ca e e enc and d va n de dec ea e, e a n c ange n ag n e c den ΔB and e engt ag n e c ed ΔH beca e a e. H e e, en e ee c ne a ed ced, c ange a b e ed n e n c ange n ag n e c den ΔB, b e c ange n e engt ag n e c ed ΔH dec ea ed. Beca e en denc c d be c n ed n a , a e a e dec ea e n n de n e e e c va n en n ne ee e ed cc ed beca e e c ange n e engt ag n e c ed ΔH n dec ea ed d e e ed ca n ee c ne , and n dec ea ed b an n c e nd e dec ea e n ΔH.

Ne , n de e a ave e ee c ne de en-den ce edd c en and e e n de n e e e c va n, e e en e B-H n c de n a ea ed b e - ea d.

W en a n ed, n n ava -e e a ecv ed b e n B_1 n and ag n de ΔB [10,11]. T e e e, e - n B_1 and e e e a n B_2 a n ed b n e e e c va n a e ead, e a e c n ed a ag n e c den a e e e ea en n e ed a e a ag n e c den a ag n e c den

a a c de n , an d e e ated a e n n e e e c ta n a b a ned b add n e e . T e c n b n e da- en a e en c c en an d e a n c c - en n de n e e e c ta n e e e- ated b add n e n e c e nd n e e en c c en eac e n 50 Hz, 0.1 -1.9 Hz an d 1.95 -20.05 Hz.

Figure 16 e ac a a e n n de n e e e c ta n an d e e ated a e n eac e en c n . T e e ated a e n e e a c a ed e ac a ea- ed a e . I n n a n ene a n c ea e n de d ec c en (DC) b a ed a ne a- n n c a n n b a ed a ne a n [10,11]. T e e , n ce a c e e a n e n a n c c en e ed n de a b a ane n b e, n c n de ed be n de e ated b e ec n e ed e e. H - e e, e en denc e n e ated e ec a c en a ne c den a n d a e en e ac a c an e n n a c a ed c an e n e ca e e en c an d d a n n de , e n a e a ac ed e e e n de an d n e en en n c ea ed n d e n e e e c ta n.

F c n n e n a n c c en , e a e c an e n n en e ee c ne an d e c ta n c n d n e e c an ed a b e ed n e 1.95 -20.05 Hz. e en c n , an d e n a c an e ed c a a e d e en e e n c an e n ea ed n n de n e e e c ta n. T e ac a e c an e n n en e n e e e c ta n c n d- n a e c an ed bec e a e a e ee c ne n c ea e c n de ed be d e an n c ea e n e a n cc ed b edd c en , c n affected b a n c c en , a e ee c ne n c ea e .

F F . 16, can be n de d a e n c ea e n n a a e ee c ne e bec e e - n can n de e c ta n c n d n e d - a n n de e . M e e, a n F . 15, e n en a n c c en n a ne c den a e dec ea e en d a n n de n c ea ed, e a be a can a be a b ed a dec ea e n e a edd c en n .

T e c a n e n n en e ee c ne a c a ed a bec e e n n ced n de e c- ta n c n d n a ca e e en c . A n e ca e d a n n de , e n en a - n c c en a dec ea e n de a ca e e en c c n d n , n d ca a d e a dec ea e n e a edd c en n .

3. Effect of ON Voltage on Iron Loss under Inverter Excitation

3.1 Experimental Procedure

T e e en a ca ed b a ne ea- en a e- a e S -N c an ne IGBT n e e c c a e e c ta n ce. **Figure 17** ea en . T e a e ON a e ON- ead e a e a e n a ne ea- en a 1.2 V, an d e a e a a ne c den a b a ned b ad e DC e V ce a e DC. F c a n ea en e e e ed an e c ta n e ce c n-

3.2 Experimental Results and Discussion

Figure 18

[illegible] . M [illegible] PWM [illegible] FFT [illegible].

[illegible] ON [illegible].

4. Conclusion

[illegible]

(1) [illegible]

(2) [illegible]

(3) [illegible] ON [illegible] DC [illegible].

(4) [illegible] PWM [illegible] ON [illegible].

References

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