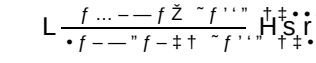
(IIHFW RI 7HPSHUDWXUH *UDGLHQW RQ 0RLVWXUH 'LIIXVLRQ L LQ /(' 3DFNDJHV

;XHMXQ DQG &DGPXV <XDQ
'HSDUWPHQW RI 0HFKDQLFDO (QJLQHHULQJ /DPDU 8QLYHUVLW\ 32 6WDWH .H\ /DERUDWRU\ RI 6ROLG 6WDWH /LJKWLQJ %HLML ,QVWLWXWH RI 6HPLFRQGXFWRUV &KLQHVH $FDGHP\ RI 6FLHQ [XHMXQ IDQ#ODPDU HGX

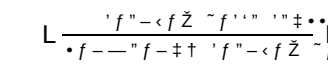
$EVWUDFW

+LJK SRZHU HOHFWURQLF GHYLFHV, UHDSSHDU DW WKH VXSHU RQ GLVVLSDWLRQ SURFHVV ULVH WR WKH MXQFWLRQ WHPSHUDWXUH DQG WKHUPDO VWUHVV DPELHQW WHPSHUDWXUH 7KLV LQFUHDVH DOVR LQGXFHV DGGLWLRQDO WKHUPDO PRLVWXUH GLIIXVLRQ IURP HQYLURQPHQW WR LQVLGH SDFNDJH DQG DFFHOHUDWHV WKH GHJUDGDWLRQ RI PHFKDQLFDO DGKHVLRQ DQG HOHFWULFDO LQVXODWLRQ 7KLV SDSHU SUHVHQWV D FRPELQHG WKHUPDO DQG PRLVWXUH GLIIXVLRQ DQDO\VLV RI 3%*$ SDFNDJH DQG VWXGLHV WKH WHPSHUDWXUH DQG PRLVWXUH GLVWULEXWLRQV LQVLGH WKH SDFNDJH 7KH UHOLDELOLW\ RI WKH SDFNDJH LV DVVHVVHG E\ FDOFXODWLQJ WKH VWUHVV GLVWULEXWLRQV DQG GHIRUPDWLRQ RI WKH GLH DQG WKH GLH DWWDFK OD\HU XQGHU WKH WHPSHUDWXUH DQG PRLVWXUH ORDGLQJ &RPSDUHG ZLWK WKH SUHYLRXV ZRUN WKLV SDSHU DGGUHVVHV WKH HIIHFW RI WKH PDWHULDO SURSHUWLHV RI WKH PROGLQJ FRPSRXQG DQG WKH GLH DWWDFK OD\HU RQ WKH UHOLDELOLW\ RI WKH SDFNDJH 7KH UHVXOWV VKRZ WKDW WKH PROGLQJ FRPSRXQG ZLWK KLJK &7(DQG KLJK PRGXOXV FDQ UHGXFH WKH PD[LPXP VWUHVV DQG GHIRUPDWLRQ RI WKH GLH DQG WKH GLH DWWDFK OD\HU DQG WKXV LPSURYH WKH UHOLDELOLW\ RI WKH SDFNDJH 7KH PD[LPXP VWUHVV DQG GHIRUPDWLRQ RFFXU DW WKH FRUQHU RI WKH GLH DQG WKH GLH DWWDFK OD\HU 7KH UHVXOWV DOVR VKRZ WKDW WKH PRLVWXUH GLIIXVLRQ LQ WKH PROGLQJ FRPSRXQG LV WKH PDLQ FDXVH RI WKH GHODPLQDWLRQ DW WKH GLH DWWDFK LQWHUIDFH DQG WKH GHODPLQDWLRQ DUHD LQFUHDVHV DOPRVW OLQHDUO\ ZLWK WKH PRLVWXUH DEVRUSWLRQ WLPH

7KH UHODWLYH KXPLGLW\ 5+ LV WKH SHUFHQW RI VDWXUDWLRQ KXPLGLW\ JHQHUDOO\ GHILQHG DQG FDOFXODWHG LQ UHODWLRQ WR VDWXUDWHG YDSRU GHQVLW\ DW WKH JLYHQ WHPSHUDWXUH DV IROORZV



2U WKH 5+ FDQ DOVR EH DSSUR[LPDWHO\ GHILQHG DV WKH SHUFHQW RI VDWXUDWHG SDUWLDO YDSRU SUHVVXUH DV IROORZV



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ZKH&UHSUHVHQWV WKH PRLVWXUH WRQWKHQWUDWLRQ
GLIIXVLYLW\ WKH WHPSHUDWXUH ,W LV QRWHG WKDW
VLQFH LW LV QRW LVRWKHUPDOO\ GLIIXVLRQ WKH
WHPSHUDWXUH DQG LV JRYHUQHG E\ $UUKHQLXV¶V HTXDWLRQ

ZKHUHL'V WKH GLIIXVLYLWV FRKHVLDQG DQGR4Q
HQHUJ\ IRU GLIIXVLYLW\ 7KH LQLWLDO DQG ERXQGDU\ FRQGLWLRQV
DVVRFLDWHG ZLWK PRLVWXUH GLIIXVLRQ DUH

%TáirL r
DQG

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:KHQ WHPSHUDWXUH JUDGLHQW DSSHDUV LQVLGH VROLGV DQG LQ
HQYLURQPHQWV WKHUH DUH WKUHH PDMRU GLVWLQFWLRQV IRU WKH DER
IRUPXODWLRQ IURP WKH WUDGLWLRQDO PRLVWXUH GLIIXVLRQ DQDO\VLV
6LQFH WKH ORFDO UHODWLYH 5+ LV DSSOLHG RQ WKH FRPSRQHQW
ERXQGDU\ WKH OHYHO RI UHODWLYH KXPLGLW\ PD\ EH
VLJQLILFDQWO\ GLIIHUHQW ORZHU IURP WKH IDU ILHOG 5+ 7KH
VDWXUDWHG PRLVWXUH FRQFHQWUDWLRQ RI PDWHULDO GHSHQGV 5+
OLQHDUO\ WKXV PRLVWXUH FRQFHQWUDWLRQ LQ FRPSRQHQW PD\
EH GURSSHG VLJQLILFDQWO\ FRPSDUHG WR WKH FDVH LI WKH IDU
ILHOG 5+ LV DSSOLHG
6LQFH WKH GLIIXVLYLW\ LV WKH IXQFWLRQ RI WHPSHUDWXUH DQG
LQFUHDVHV H[SRQHQWLDOO\ ZLWK WHPSHUDWXUH WKH PRLVWXUH
GLIIXVLRQ ZLOO EH IDVWHU WKDQ WKH LVRWKHUPDO FRQGLWLRQ RI WKH
VDPH WHPSHUDWXUH WR WKH DPELHQW 7KLV LPSOLHV WKDW HYHQ
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GLUHFWLRQ WKH PRLVWXUH DEVRUSWLRQ ZLOO EH DFFHOHUDWHG GXH
WR WKH KLJK WHPSHUDWXUH LQVLGH KHQFH KLJKHU GLIIXVLYLW\
DQG LW WDNHV OHVV WLPH WR UHDFK WR WKH VWHDG\ VWDWH PRLVWXU
GLIIXVLRQ VWDWH
)RU PRVW HOHFWURQLF SDFNDJLQJ PDWHULDOV WKH VDWXUDWHG
PRLVWXUH FRQFHQWUDWLRQ LV LQGHSHQGHQW RI WHPSHUDWXUH LQ D

$SSHQGL[

7DEOH $ 6DWXUDWHG YDSRU GHQVLW\ DQG SUHVVXUH RI ZDWHU

7HPSHU	