

8OWUDIDVW HOHFWURQ VSLQ G\QD R2 FV  
VRJHO WLKLPVI

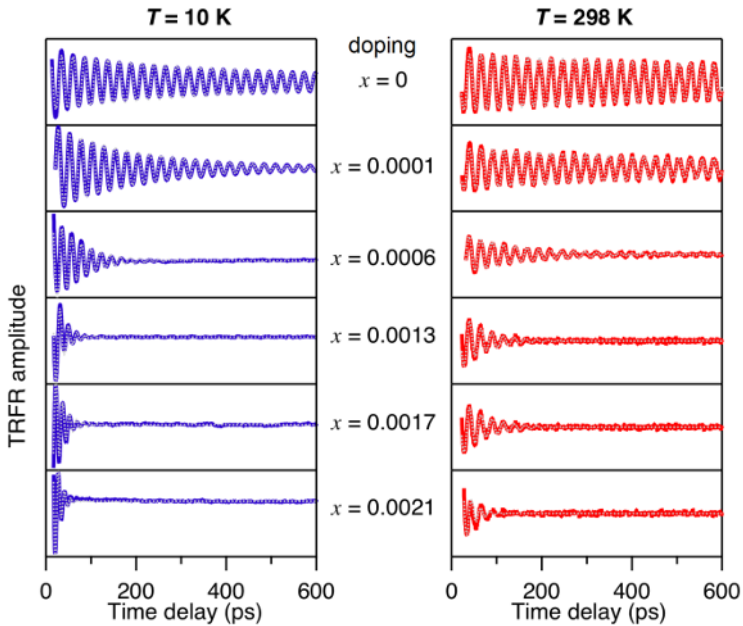
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0 )RQL0 5•GL\$HVLHWHQVWRUDRFD0000 5 %UDWVFKLWVFK  
,QVWLWXWH RI 3K\VLV &KHPQLW] 8QLYHUVLW\ RI 7HFKQR  
'HSDUWPHQW RI &KHPLVWU\ 8QLYHUVLW\ RI :DVKLQJWRQ  
'HSDUWPHQW RI 3K\VLV DQG &HQWHU IRU \$\$\$OLHG 3KRW

\$EVWU:DFWUREH WKH HOHFWURQ VSLQDQ R2 VRODPIH0 ILQDQ 2 D  
ZLWK WLPH UHVROYHG )DUDGD\ URWDWLRQ QWKSIRWGRV FRIS  
QDQRVHFRQGV DUH REVHUYHG DW URRP WHPSHUDWXUH  
=Q&R2 WKH HIIHFWLY HDHFWREUWWRGHV DZLGR QLFHUMDDWQ & R  
SURYLGLQJ WKH P&BCHIEKDDGJHCHFWURQ H9

6HPLFRQGXFWRUV DUH ZHOO VXLWHG IRU XOWUDIDVW RS  
PD\ EH XVHG WR LQWLWLDOL]H PDQLSXODWH DQG UHGD  
IURP WKUHH WR ]HUR GLPHQVLRQV 7KH ZLGH EDQGJDS  
EDQGJDS RI H9 DQG DQ H[FLWRQ ELQGLQJ HGHUJ\ RI  
EHQHILFLDO WR URRP WHPSHUDWXUH RSHUDWLRQ RI IXW  
PD\ DOVR EH UHGDLO\ GRSG&RZLWV PDHFWLWHS IRVW DRUGI  
WKH SDVW GHFDGH HYHU VLQFH UHSRUWV RI URRP WHP  
DSSHU 5HPDUNDEO\ WKHH PDHFWLWRQGH H[RIKDWKHW &RPHUJ  
PHDVXUHG IRU WKLV GLOXWHG PDJQHWLF VHPLFRQGXFWRU  
:H XVH WLPH UHVROYHG )DUDGD\ URWDWLRQ 75)5 VSHF  
WKH WUDQVLHQW HOHFWURQ VSLQ G\QD R2 FV W R Q FKH PILIOP  
)LJXUH VKRZV 75)5 WUDFHV RI DQ XQGRSHG =Q2 VRO JHC  
DQG URRP WHPSHUDWXUH DORQF QZLW KILVDFW FROQR  
FRQFHQWUDWLRQV

6XUSULVLQJO\ 75)5 VLJQDOV QRW RQO\ SHUVLVW XS V  
GHSKDVLQJLWDFHVDHV ZLWK ULVLQJ WHPSHUDWXUHV LQ  
IRU HSLWD[LDO =Q2 ILOR&R26RORZHD VLEODRUI WQPSHUDWX  
7KH FRQWUDVW ZLWK HSLWD[LDO7ILRCPHUVXHG LQ W W KHVW W  
DULVHV IURP WKHLU JUDQXODULW\ +ROH WUDSV DW WKH  
UHFRPELQDWLRQ DQG KHQFH DOORZ REVHUYDWLRQ RI H[  
REVHUYHG WKLW HIIHFW LQ D SUHYLRXV VWXG\ RQ WKH XO  
> @ DQG EHOLHYH WKDW WKLW PHFKDQLVP LV DOVR DFWLY  
K\SRWKHVLV E\ SURELQJ WKH FDUULHU UHFRPELQDWLRQ  
UHFRUGLQJ GLIIHUHQWLDO WUDQVPLVVLRQ DQG FRPSDULQ  
75)5 PHDVXUHPHQWV

(3 - :HE RI & RQIHUHQFHV



)LJ 7LPH UHVROYHG )DUDGD\ URW\ DZLRRQF\ XHU HWK LRUI = QZVD  
 WHP SHUDWXUH RI 7 . OHIW DQG URRP WHP SHUDWXUH  
 GLVSOD\HG DV GRWWHG OLQHV

:H QRZ WXUQ WR PDJQHWLFDOO\ GRWLRQ = QZVD DQG  
 LQFUHDVH LQ WKH SUHDFWLRQ\ DZLRRQF\ YHG )LJ 7  
 GHSHQQHG\ WKH RI RZQ LQ )LJXUH J, QH\ QG S\ HQHQ\ FRQ  
 7 DQG J . ± [ & QZ = KRZHYHU FUHDVHV ZLWK  
 WHP SHUDWXUH DSSURDFKLQJ WKDW RI WKH XQGRSHG = QZ  
 UHIOHFW WKH H[LVWHQFH RI H[FKDQJH FRXSOLQJ GRWLRQ  
 \$ JOREDO ILW RI WKH GDWD LQ & RLJXUH\ H[FKDQJH S\ WKH  
 1. “ H9 7KH YDOXH UHSRUWHG KHUH LV LQGHSO  
 XVLQJ VWHDG\ VWDWH H[SHULPHQWDO\ WDLQ\ QZVD DQG  
 VXJJHM\WG H9 ZKLFK LV LQ JRRG DJUHHHQW ZLWK RXU  
 7KH VFRQG VWULNLQJ REVHUYDWLRQ\ WKH H[FKDQJH S\ WKH  
 VWURQJO\ DFFHOHUDWHG QZVD DQG WHP SHUDWXUH = QZ & OPV :L  
 7 GURSV IURP WR . S\ H[FKDQJH WHP SHUDWXUH GHSDVLRQJ  
 LPSXULWLHV LV GXH WR ORFDO IOXFWXDWLRQ RI WKH  
 IOXFWXDWLRQ\ DQG IURP PLFURVFRSLFDOO\ LQKRPRJHQHRXV  
 LRVHD EHDNGRZQ RI WKH YLUWXDO FU\WDO DSSUR[LPH  
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 D PRGHO EDVHG RQ WKHVH WZR HIIHFWV

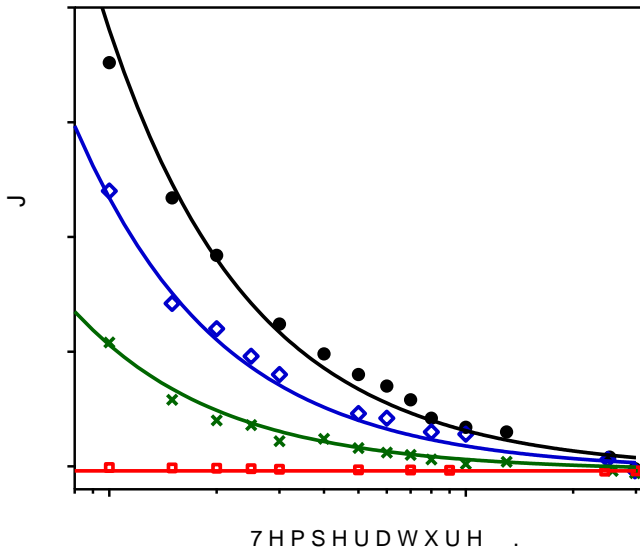


Fig. 2. 7HPSHUDWXUH GHS HQGHQBHLR 80KZLWKF WLYHLOOBWFLR  
RSHQ GLDPRQGV FURVVHV DQG XQG

,Q FRQFOXVLRQ ZH KDYH (SP) HSDUHG XLODQB HQ RSW  
JHQHUDWLRQ DQG GHWHFWLRQ XVLQJ UDSL EDURNOXWLSURF  
DGYDQFH LQ WKH GHYHORSHPHQW RI IOH[LEOH ORZ FRVW  
GLOXWHG PDJQHWLF VHPLFRQGXFWRUV LQWR XOWUDYLRO  
DQG RSWR VSLQWURQLF GHYLFH (SR) XFOVXUHQVILQ VERWKH  
HOHFWRQ VSLQJHURQJULFHW HOHYDWHG WHPSHUDW  
LV DWWULEXWHG WR LQKLELWLRQ RI FDUULHU UHFRPELQ  
DQDO\VLV RI WKH HOHFWRQJULFHW HOHYDWHG WHPSHUDW  
HOHFWRQJULFHW FRXSOLQJ (SR) DPHWVHHQQGHQ HUPLQ  
1. " H9

. 0 :KLWDNHU 0 5DVNLQ \* .LOLDQL . %HKD 6 7 2  
5•GLJHU \$ /HLWHQVWRUIHU ' 5 \*DPHOLQ DQG 5 %UD  
1 -DQ%HQ . 0 :KLWDNHU ' 5 \*DPHOLQ DQG 5 %UDWV  
7 7KRPD\ 7 +DQNH 0 7RPDV ) 6RWLHU . %HKD 9  
5 \*DPHOLQ \$ /HLWHQVWRUIHU DQG 5 %UDWVFKLWVFK