

Project Summary

7KH JURZWK RI FKHPLFDOO\ EDVHG LQGXVWULHV KDV OH
SHUVLVWHQW SROOXWDQWV OL32538031MWHQW238DQILFX
6XEVDQ\$6HVWKUHDWHQLQJ HFRV\VWHPV DQG KXPdq KHD
FRQWDPLQDWHG ZDWHU VXIIHU IURP KLJK FRVW DQG ORZ
UHVHDFK SURSRVHV D SRUWDEOH K\GURG\QDPLF FDYLW
SROOXWDQWV DQG HQKDQFLQJ ZDWHU WUHDWPHQW DQG U
UHSOLFDWH DQG GRZQVFDOH WKH 8QLYHUVLW\ RI WKH :HY

Introduction

\$ PRELOH FDYLWDWLRQ V\ VWHP ZDV FRQVWUXFWHG DW WKH
WKH 8QLYHUVLW\ RI WKH :HVWHUQ &DSHV 8:& SLORW SO
UHVHUYRLU WHPSHUDWXUH JDXJHVW ~~BOGONZYBUDDFDLRQ~~ Y
WKH 8:& GHVLJQ DQ DFRXVWLF OLVWHQLQJ GHYLFH ZDV L
FDYLWDWLRQ YHULILFDWLRQ 7KH 8:& V\ VWHP KDV D N:
IHDWXUHV D K\GUDXOLF ~~FDKHDGXSJUDGEB&WWRDY~~ +S %RWK
VWHHO SLSLQJ WR PD[LPLVH FRUURVLRQ UHVLVWDQFH 7KH
FDSDFLW\ RI DSSUR[LPDWHO\ / ZKHUHDV WKH SLORW SO
H[SLFHQW REMHFWLYHV ,Q DGGLWLRQ WKH UHVHUYRLU RI
FRQWURO WKH WHPSHUDWXUH RI WKH ZDWHU

)LJXUH 5HVHUYRLU FDYLWDWLRQ V\ VWHP IRU OHDNV DQG

Cavitation fundamentals

)LJXUH \$Q DWWHPSW WR GHPRQVWUDWH V\SKRQLQJ FDYL
DQG WØRWUH EXFNHWV

7KH IXQGDPHQWDOV IRU FDYLWDWLRQ RFFXU XQGHU FHU
OLVVRXUL 8QLYHUVLW\ LQ WKH +LJK %D\ /DERUDWRU\ ZKL
6\SKRQLQJ FDYLWDWLRQ RFFXUV XQGHU FHU\WDUHQHWRXQGD
PP GLDPHWHU SLSH DQG EXFNHWV ZDV XVHG WR GHPRQ
XQGHUVWDQGLQJ RI WKLW FRQFHSW WKH WDVN DW KDQG Z
DQRWKHU ZLWKRXW WKH DGGLWLRQRIQDKPHLEKDWQZFDWHSXIP
DQG EXEEOH IRUPLQJ RFFXUV ZKHQ QDWXUDO FDYLWDWLRQ
WKH EXEEOH IRUPLQJ DW D FHUWDLQ KHLJKW UHVWULFWLF
IROORZV

3 !YB ð 3!JK !YB ð !JK

:KHUH

3 3 UHSUHVHQWV GLIIHUHQW SUHVXUHV DW SRLQWV D
Y Y UHSUHVHQWV WKH YHORFLWLHV DW SRLQWV DQG
K K UHSUHVHQWV WKH KHLJKWV DW SRLQWV DQG

The outcome of the project

7KH FROODERUDWLRQ EHWZHHQ WKH WZR LQVWLWXWLRQV Y
SHUVSHFWLYH 7KH GHYHORSPHQW RI WKH PRELOH FDYLWD
LQLWLDO WHVWLQJ DQG FHUWDOO\RSQ\LP\VSXPISRQDSKDFLWV
KDYH EHHQ LGHQWLILHG DQG ZHUH DGGUHVVHG WKURXJK
YDU\LQJ RULILFH VL]HV ,Q DGGLWLRQ OHDNV DQG EORFI
SXPSLQJ HIILFLHQF\

7KH DGDSWDWLRQ RI RULILFH SODWHV LQ K\GURG\QDPLF
FDYLWDWLRQ HIIHFWV \$PRQJVW DOO H[SHULPHQWV WKH
VL]H VR IDU WKDW VKRZHG WKH HGHDO\FCRQ\GK\WIK\Q\VKWUWK
RI VHOHFWLQJ DSSURSULDWH RULILFH GLPHQVLRQV WR DFK
SROOXWDQWV *LYHQL\WKH\VL\W\W\FG\W\DU\H\G\H\RI WKH RUL
IDFLOLWDWH WKH UDSLQ FDKQJH LQ WKH SUHVXUH GURS
'HQ]DO\H\DW\SH\W\H\F\W\H\DEL\OLWLHV RI WKH +& V\WHP DQG
EH H[SORUHG LQ KLV UHVHDUFK DW 8:&

Upcoming activities

7KH PRQWKV\K\H\H\W\H\G\W\K\K\ ZD\ IRUZDUG IRU D VWURQJHU
LQVWLWXWLRQV LQ SDUW\FXODU WKH 'HSDUWPHQW RI &KH
WKH &LYLO (QJLQH\HULQJ 'HSDUWPHQW DW WKH 8Q\W\H\U\VLW
DW 80.& LV RQJRLQJ DQG GRFXPHQWHG DORQJ WKH\H\Z\ 7I
UH\LM\Z\H\G\QDO DUH KLJKO\ OLNHO\ EDVHG RQ IXUWKHU FRO

\$GGLWLRQDO UHVHDUFK FRXOG H[SORUH WKH HIIHFWV RI Y
DV WKH QXPEHU RI KROHV WR DFFRPPRGDWH WKH VXUIDFH
7KH SDUDPHWHUV RI WKH V\WHP\LP\DW\HG\W\OR\QJ\Z\LP\Q\G\W\H\W\B
RI WKH VHOHFWHG G\HV 9HULI\LQJ WKDW IUHH UDGLFDQV
K\GURJHQ SHUR[LGH\K\O\LD\Q\H\Y\G\H\W\H\LRQ\ PHWKRGV

