

Project Summary

7KH JURZWK RI FKHPLFDOO\ EDVHG LQGXVWULHV KDV OH
SHUVLVWHQW SROOXWDQWV OLNH DQWV DQG DQWV DQG DQWV
6XEVDQWV DQG DQWV DQG DQWV DQG DQWV DQG DQWV
FRQWDPLQDWHG ZDWHU VXIIHU IURP KLJK FRVW DQG ORZ
UHVHDFK SURSRVHV D SRUWDEOH K\GURG\QDPLF FDYLW
SROOXWDQWV DQG HQKDQFLQJ ZDWHU WUHDWPHQW DQG UH
UHSOLFDFWH DQG GRZQVFDORU 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 ~~FDKHDGXS~~ IJUDG ~~E&WWZDV~~ +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 5HV ~~FLQW~~ 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\VSXPSRQDSKDFLWV
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 HGHLDO\FCRQ\GK\WIK\Q\VKWUWK
RI VHOHFWLQJ DSSURSULDWH RULILFH GLPHQVLRQV WR DFK
SROOXWDQWV *LYHQL\WKH\VLVW\FG\WIDU\H\JHR\WKH RUL
IDFLOLWDWH WKH UDSLQ FDKQJH LQ WKH SUHVXUH GURS
'HQJDO\HDW SHU\H\FV\H\H\DELQWLHV RI WKH +& V\VWHP DQG
EH H[SORUHG LQ KLV UHVHDUFK DW 8:&

Upcoming activities

7KH PRQWKV\K\SDYH\G\W\K\ZD\ IRUZDUG IRU D VWURQJHU
LQVWLWXWLRQV LQ SDUW\FXODU WKH 'HSDUWPHQW RI &KH
WKH &LYLO (QJLQHULQJ 'HSDUWPHQW DW WKH 8QW\FUUVLW
DW 80.& LV RQJRLQJ DQG GRFXPHQWHG DORQJ WKH\ZD\ 7I
UHYL\W\K\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\VWHP\DW\HG\W\ORQJ\Z\DP\Q\G\W\W
RI WKH VHOHFWHG G\HV 9HULI\LQJ WKDW IUHH UDGLFDQV
K\GURJHQ SHUR[LGH\K\K\O\Q\Q\Y\G\W\H\WLRQ\PHWKRGV

