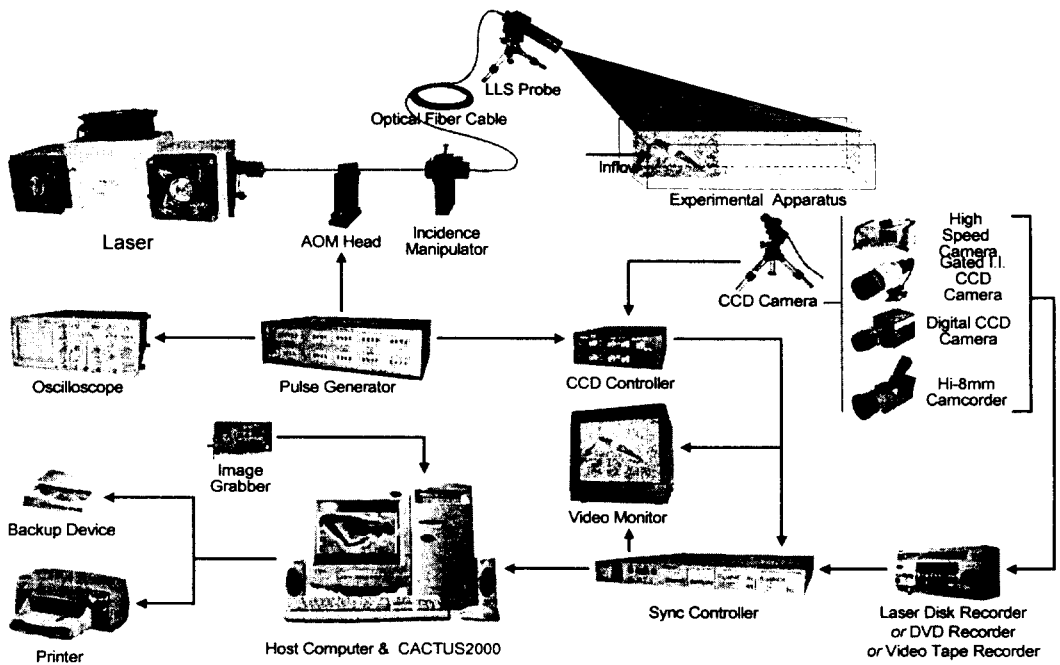


PIV의 산업계 적용사례 소개

이현* 이영호**

* 아이아이티(주)

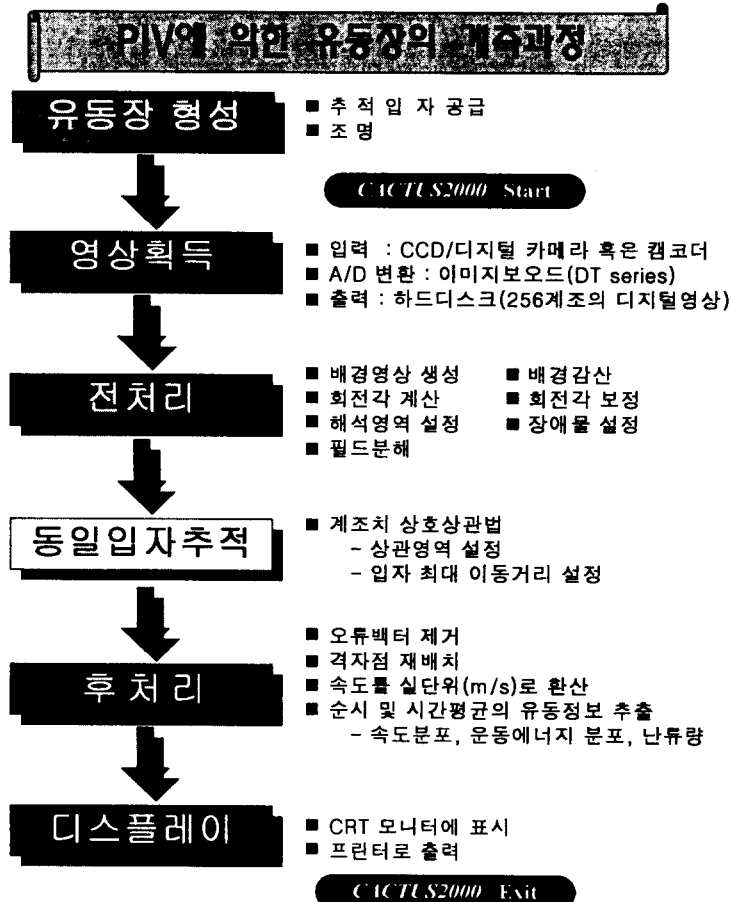
** 한국해양대학교 기계·정보공학부

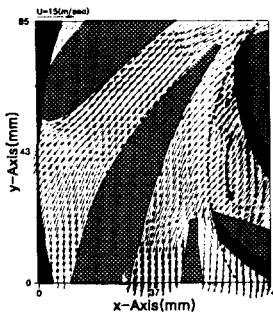
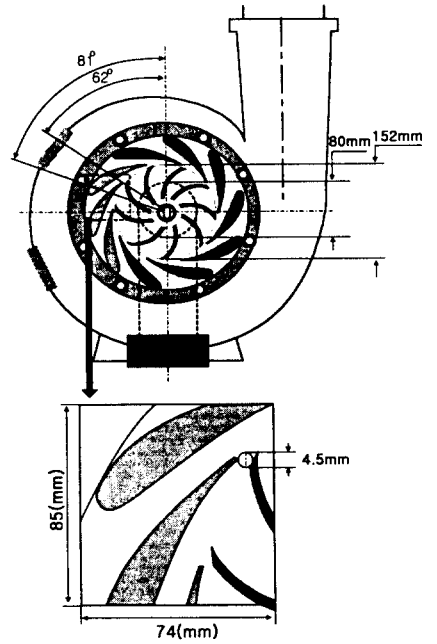
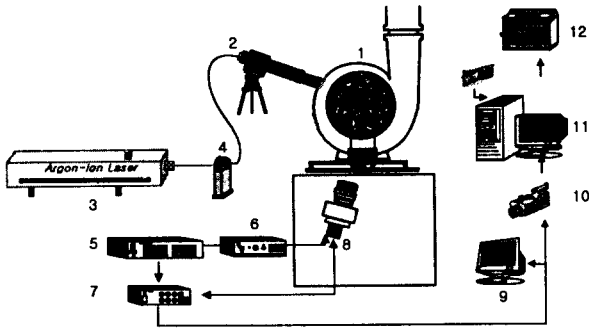


PIV 기본 시스템 구성도

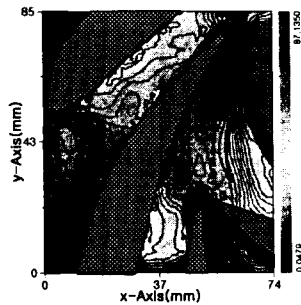
현재 각국에서의 PIV의 응용분야

- 신형엔진개발에서의 고효율 연소실 형상 및 냉각수 유동제어 기술개발 (미국, 영국, 일본, 한국 등)
- 자동차모델 개발시의 공력특성(항력계수 등)의 정량적 해석(일본)
- 항공기 및 초고속선, 고속전철의 저항감소를 위한 유동 모델실험(EURO지역)
- 신형 냉장고 설탁기 및 에어컨 개발시의 냉기유동 예측(한국)
- 각종 팬, 펌프, 압축기 등 유체기기의 유동해석 설계 기술개발(미국, 일본, 한국)
- 환경, 건축 및 토목공학 분야에서의 유동장 해석(일본, 미국)
- 생체의학분야에서의 혈류해석 등의 bio-fluids 연구(미국, 일본, 한국)
- 각종 열교환기의 내부유동 해석(일본)
- 조류 및 해양구조물의 유동해석(일본, 영국)
- 오염물질 유동 확산예측 모델링 실험(일본, 한국)
- 연구소 및 대학에서의 유체공학 관련 교육 및 연구용 기자재 개발

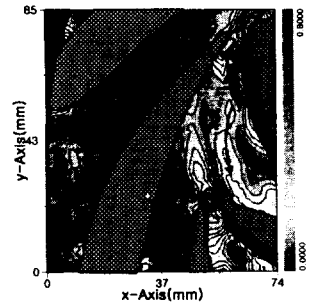




Velocity Vectors

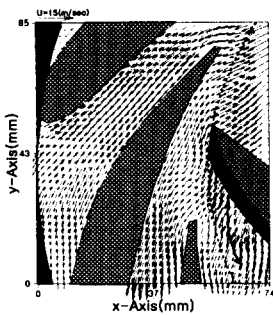


Kinetic Energy

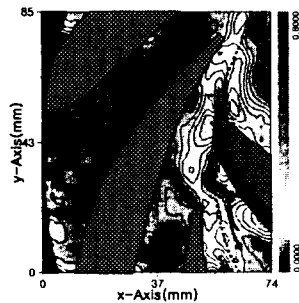


Turbulence Intensity

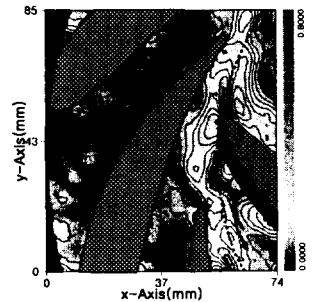
Relative Position of Impeller : 62°



Velocity Vectors

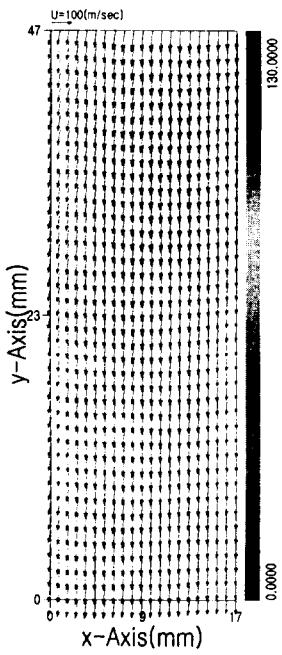
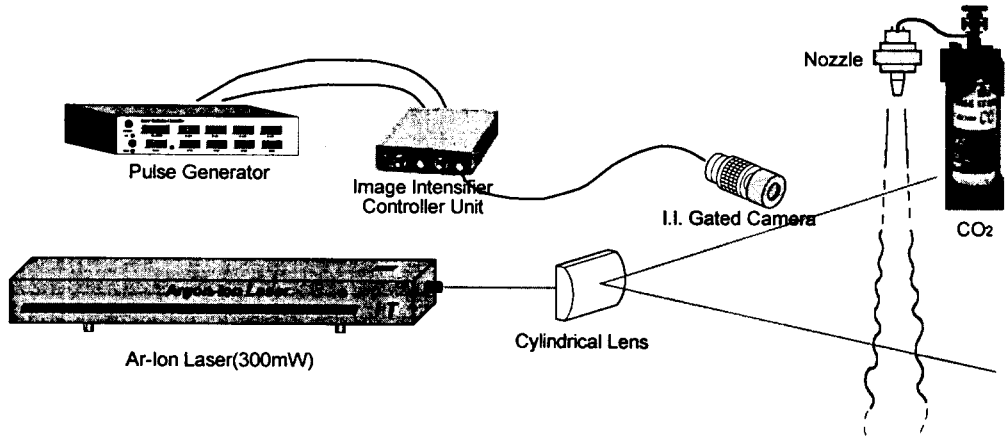


Kinetic Energy

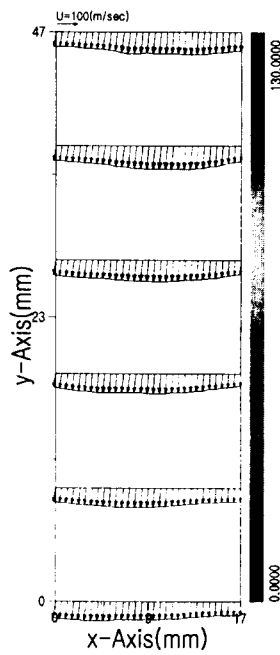


Turbulence Intensity

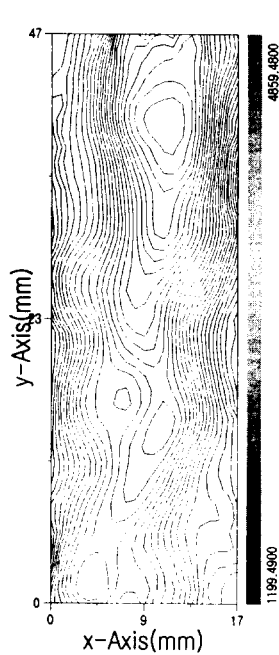
Relative Position of Impeller : 81°



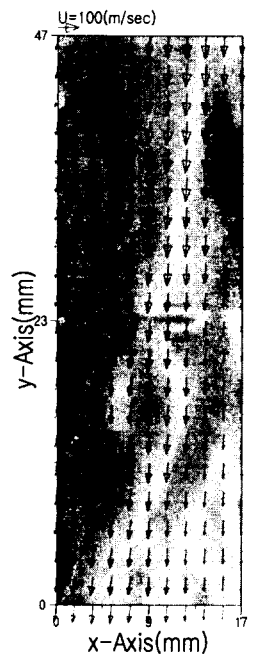
Velocity Vectors



Velocity Profile

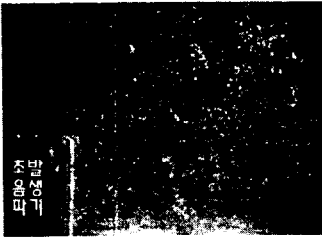


Kinetic Energy

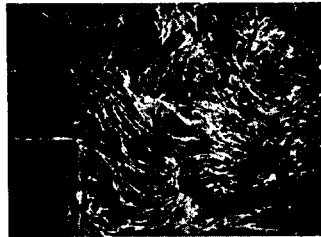


Vorticity

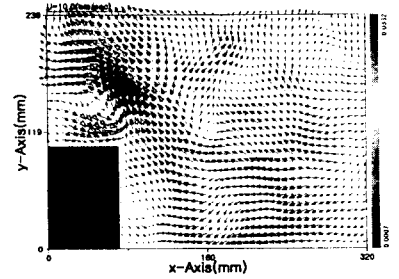
Result of Time Averaged Image



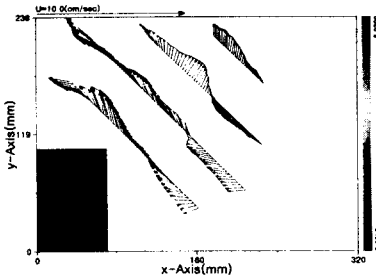
Original Image



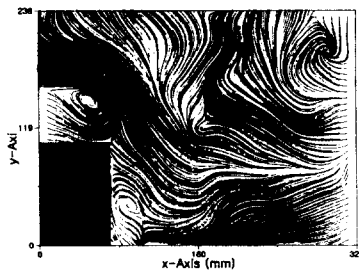
Pathlines



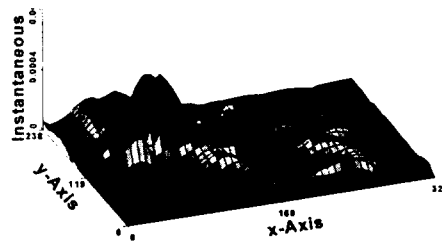
Instantaneous Velocity Vectors



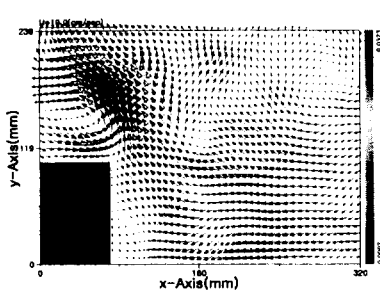
Instantaneous Velocity Profiles



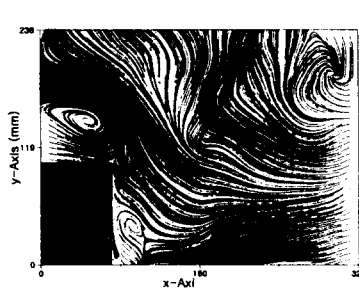
Instantaneous Quasi-streamlines



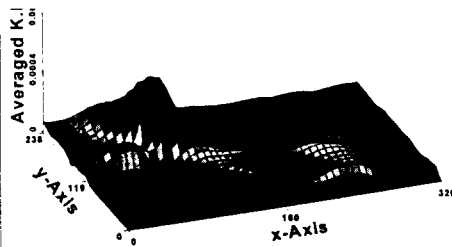
Instantaneous Kinetic Energy



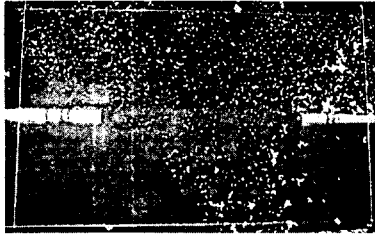
Time-averaged Velocity Vectors



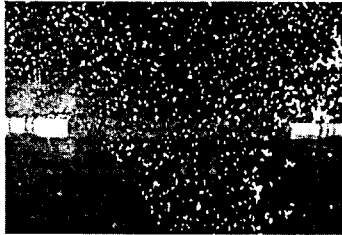
Time-averaged Quasi-streamlines



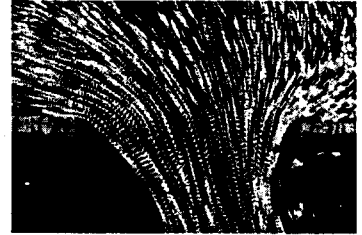
Time-averaged Kinetic Energy



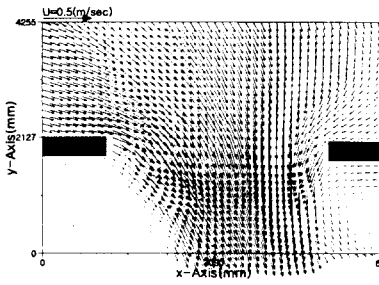
Original Image



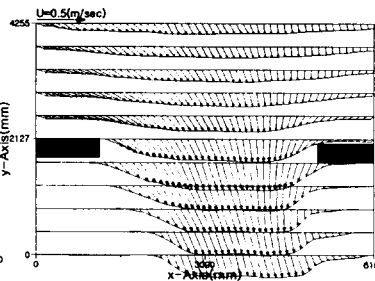
Transformed Image



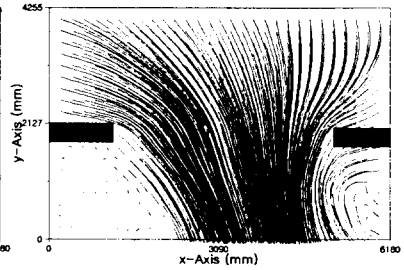
Pathlines



Velocity Vectors

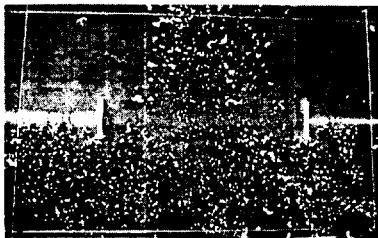


Velocity Profile



Instantaneous quasi-streamlines

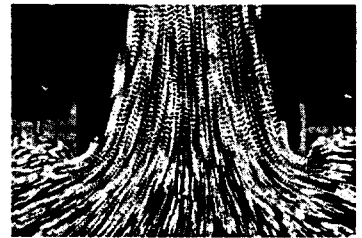
(A) Groyne not used



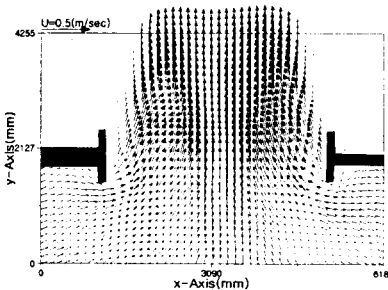
Original Image



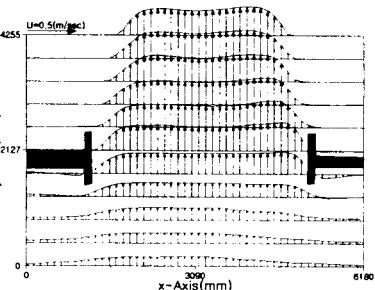
Transformed Image



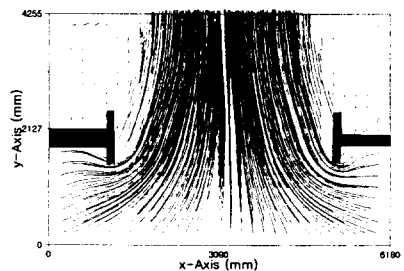
Pathlines



Velocity Vectors

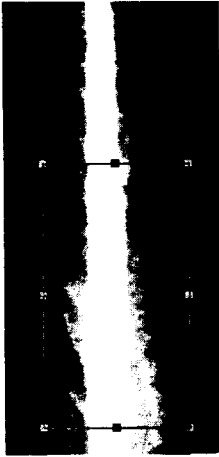


Velocity Profile

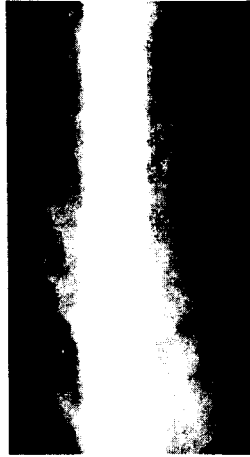


Instantaneous quasi-streamlines

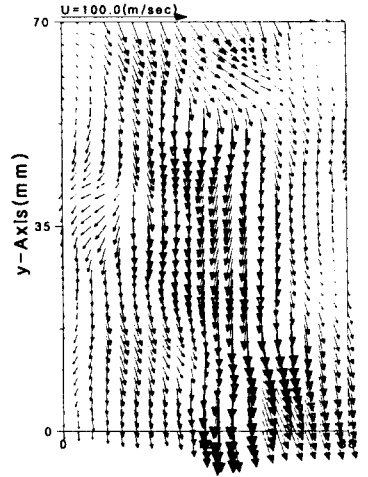
(B) Groyne used



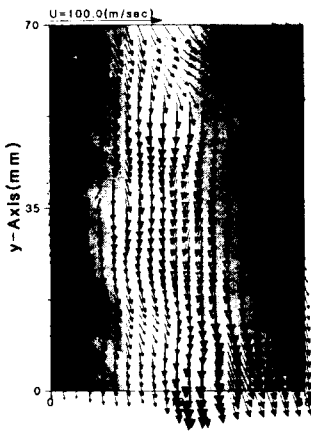
Original Image(Total Region)



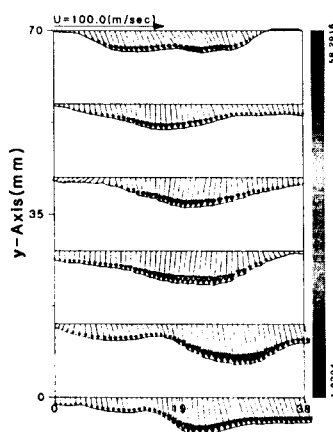
Original Image(Coordinated Region)



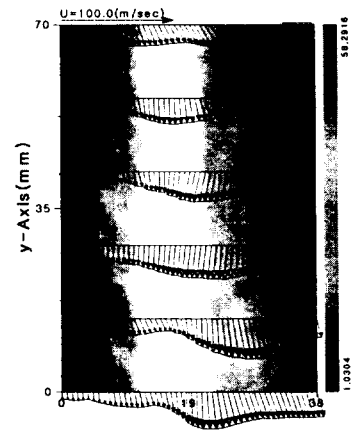
Velocity Vectors



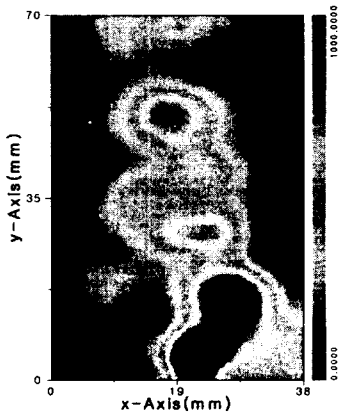
Velocity Vectors +Background



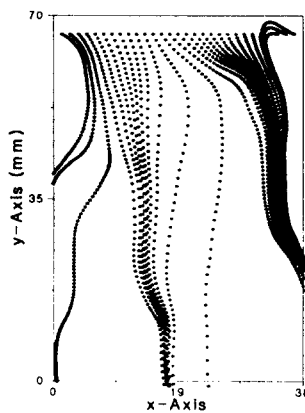
Velocity Profile



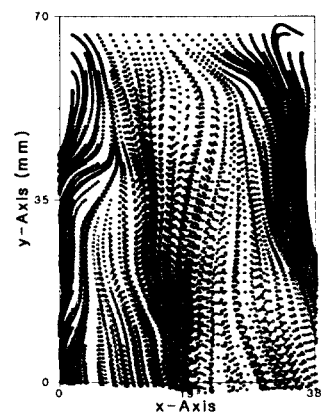
Velocity Profile +Background



Kinetic Energy

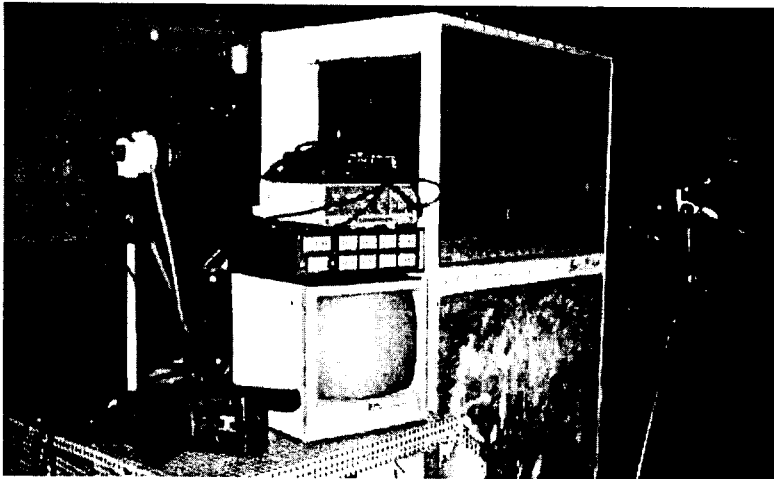


Pathlines I

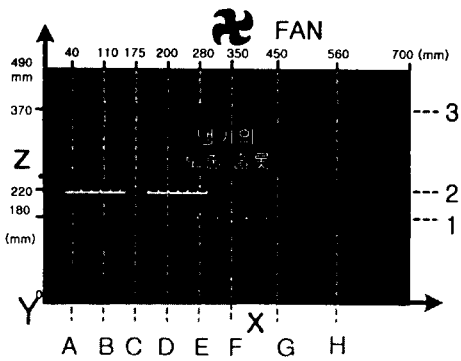


Pathlines II

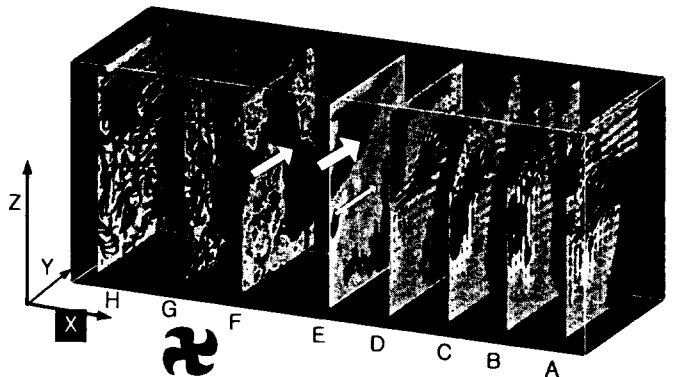
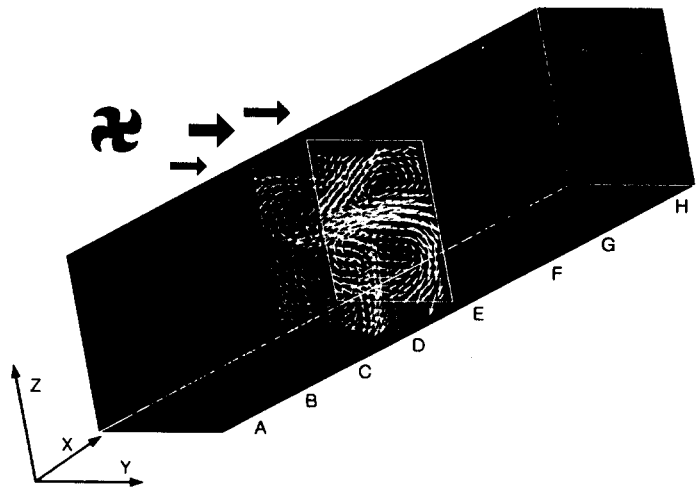
실시간 측정 시스템

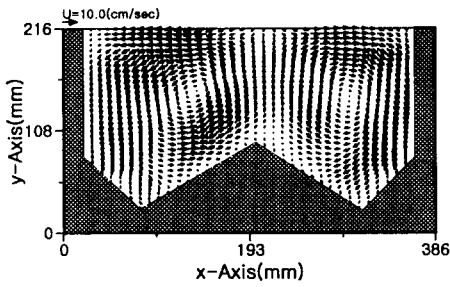
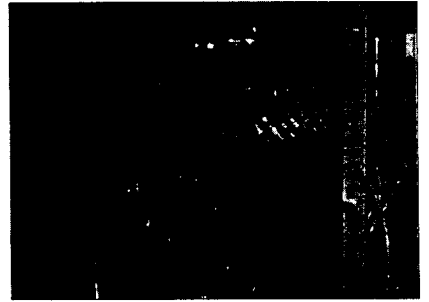
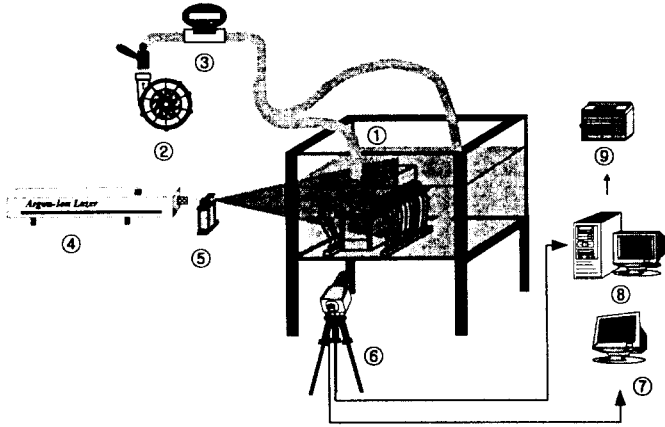
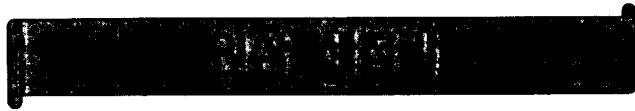


시스템 구성도

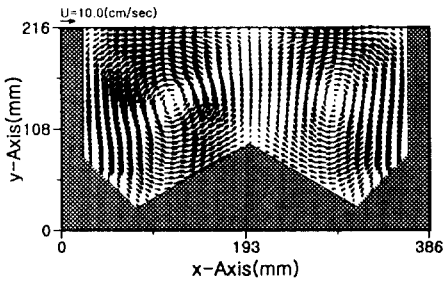
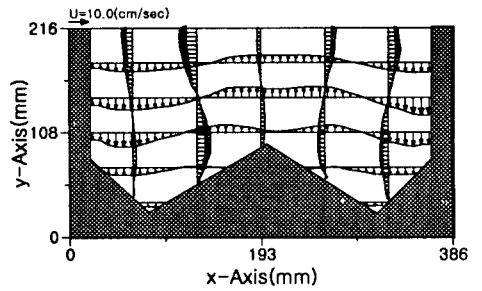


계측단면 설정

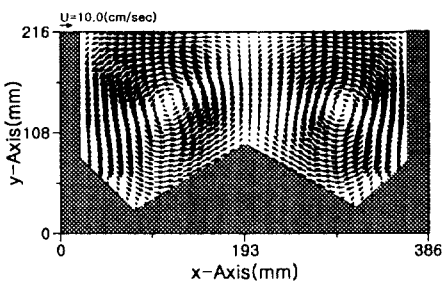
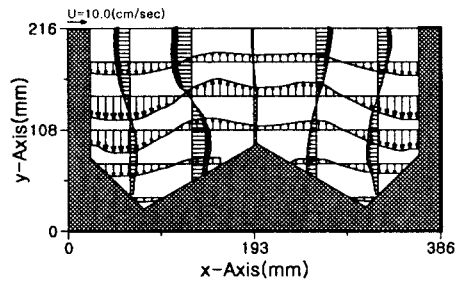




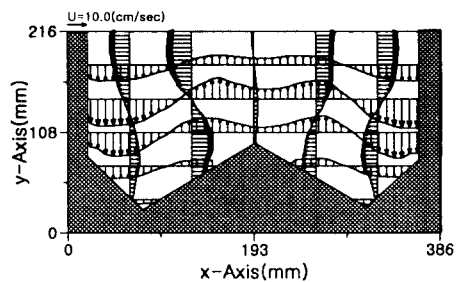
15 l/min

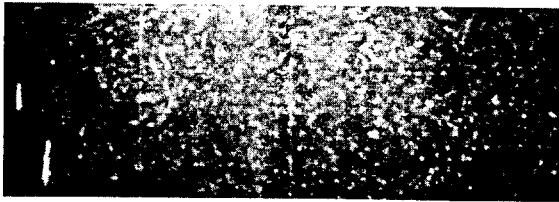


20 l/min

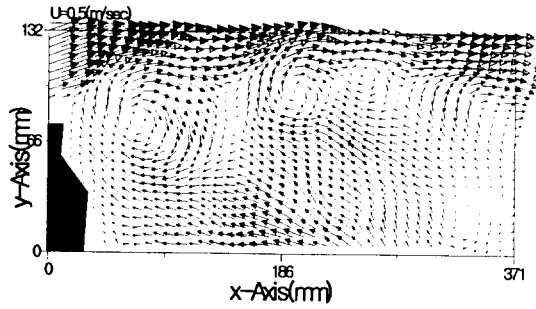


27 l/min

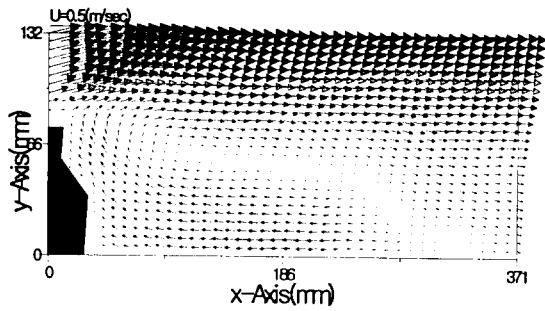




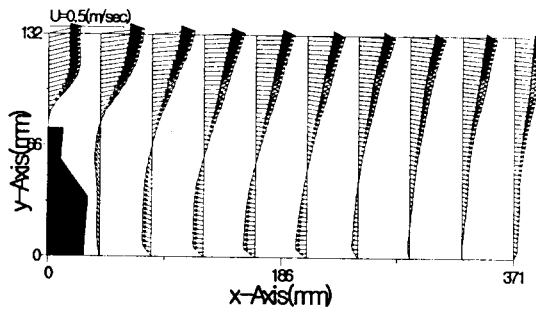
Original Image



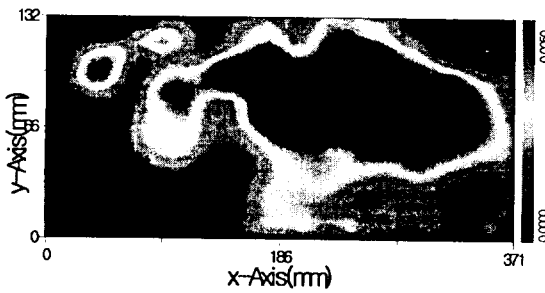
Instantaneous Velocity Vectors



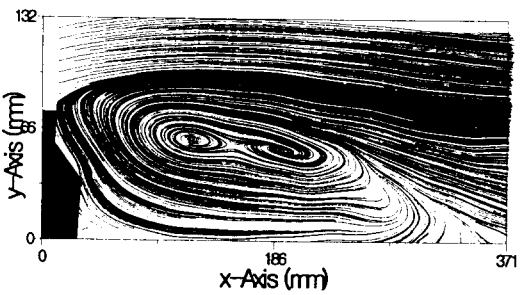
Time-mean Velocity Vectors



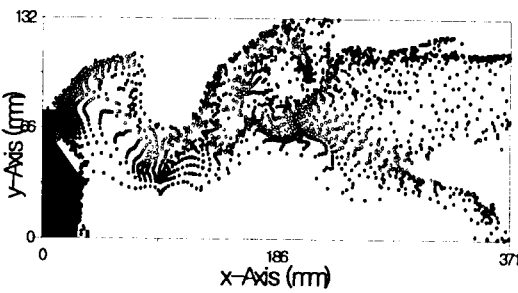
Time-mean Velocity Profile



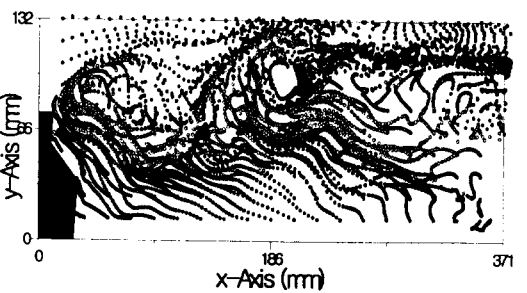
Kinetic Energy



Quasi-streamlines



Pathlines I



Pathlines II