Chapter 4

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 - 4-1 Eulerian Description

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- Pressure Field: P = P(x, y, z, t)
- Velocity Field: $ec{V}=ec{V}(x,y,z,t)$
- Acceleration Field: $ec{a}=ec{a}(x,y,z,t)$

where the rate of change of the particle's x-position with respect to time is u and similar to y(v) and z(w)

$$ec{a}(x,y,z,t) = rac{\partial ec{V}}{\partial t} + u rac{\partial ec{V}}{\partial x} + v rac{\partial ec{V}}{\partial y} + w rac{\partial ec{V}}{\partial z}$$

and in Cartesian coordinates, we could get that

$$egin{cases} a_x = rac{\partial u}{\partial t} + urac{\partial u}{\partial x} + vrac{\partial u}{\partial y} + wrac{\partial u}{\partial z} \ a_y = rac{\partial v}{\partial t} + urac{\partial v}{\partial x} + vrac{\partial v}{\partial y} + wrac{\partial v}{\partial z} \ a_x = rac{\partial w}{\partial t} + urac{\partial w}{\partial x} + vrac{\partial w}{\partial y} + wrac{\partial w}{\partial z} \end{cases}$$