(4.5) Unique weak solutions in 2-D

<u>Theorem 1</u>: $n=2$. The solution, u, of the N-S-eq

$$\frac{du}{dt} + \nu Au + B(u,u) = f$$

satisfies $\quad u \in C^0([0,T]; H)$

and $\quad u_0 \mapsto u(t) \quad$ is continuous. In particular:

The solution is unique.

<u>Proof</u>: In class presentation #5.

Consequence: Lipschitz property

$$\|u(t) - v(t)\|_{L^2} \leq L(T)\, \|u_0 - v_0\|_{L^2} \qquad 0 \leq t \leq T.$$

Semidynamical System $\left(H, \{S_H(t)\}_{t \geq 0} \right)$

$S_H(t)u_0 = u(t)$, $\quad S_H(t)$ is a C^0-semigroup.