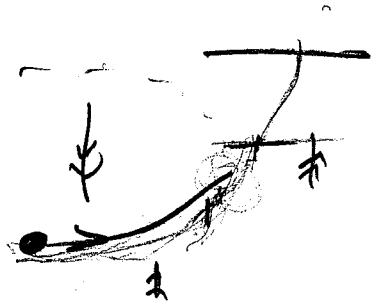
$$\dot{u} = \mu + u^2$$

$$\dot{\mu} = \varepsilon(\mu + 1)$$

$t \in (-\infty, 0)$

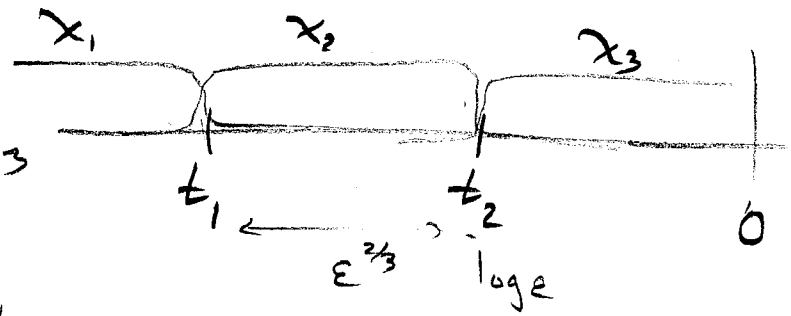


$(u,\mu)(-\infty) = (-1,-1)$

$u|_{t=0} = \delta$

$$(u,\mu) = \sum_{j=1,2,3} \chi_j (u_j, \mu_j)$$

χ_j p.o.u.) $\chi_{1/2,3}$



$t_{1/2}$ chosen dependent on ε

---

1) (u_1, μ_1) ⟶ slow mfd / unstable mfd of

construct on $u \in (-1, -u_1)$ ← depend on ε?

δ

2) $\tilde{u}' = -1 + \tilde{u}^2$ $\quad u = \varepsilon \tilde{u}$

$\tilde{\mu}' = 1 + \ldots$ $\quad \vdots$

ex! $\tilde{u}, \tilde{\mu}$: $\tilde{u} \to -1$, $t \to -\infty$

ex. $(u_1, \mu_1)(\varepsilon t - \sigma_1, \varepsilon)$ exact sol

$(u_1, \mu_1)^{\sigma_1}(0) = (-\sigma_1 - \sigma_1^2)$

$(u_2, \mu_2) = (u_R, \mu_R)(\varepsilon^{2/3} t + \sigma_2)$

u_R, μ_R from $\bar{u}\,\bar{\mu}$ - eq'

(u_3, μ_3) from $\dot{u} = u^2$, $u(0) = \delta$

$\dot{\mu} = 0$

$(u_3, \mu_3)(t)$