

Chaotická Dynamika

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Obsah

- **Vývoj populace – program Famulus**
- **Fázový prostor, Poincarého řez**
- **Billiard**
- **Dvojitě kyvadlo**

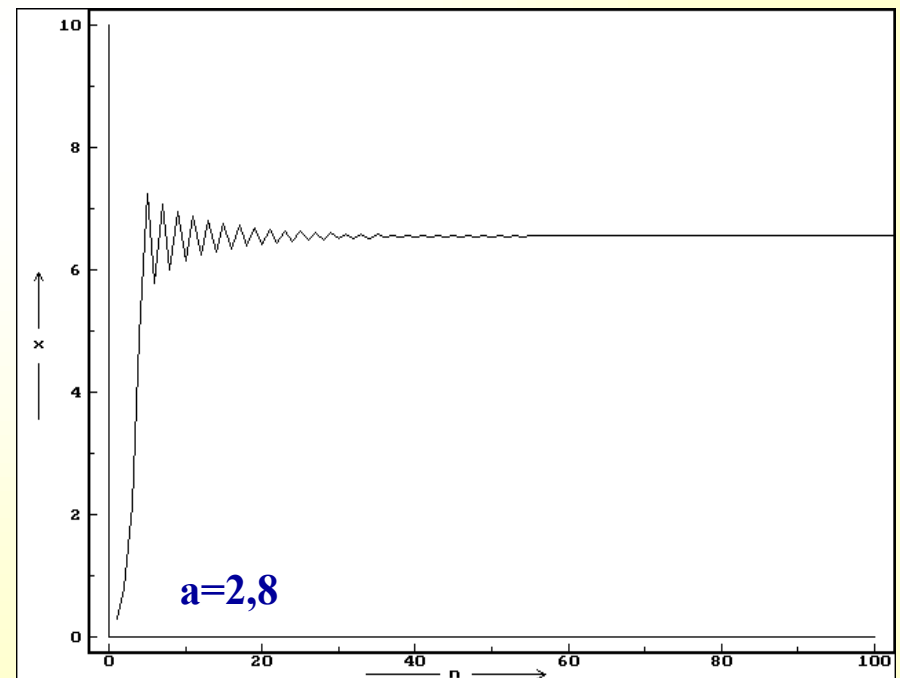
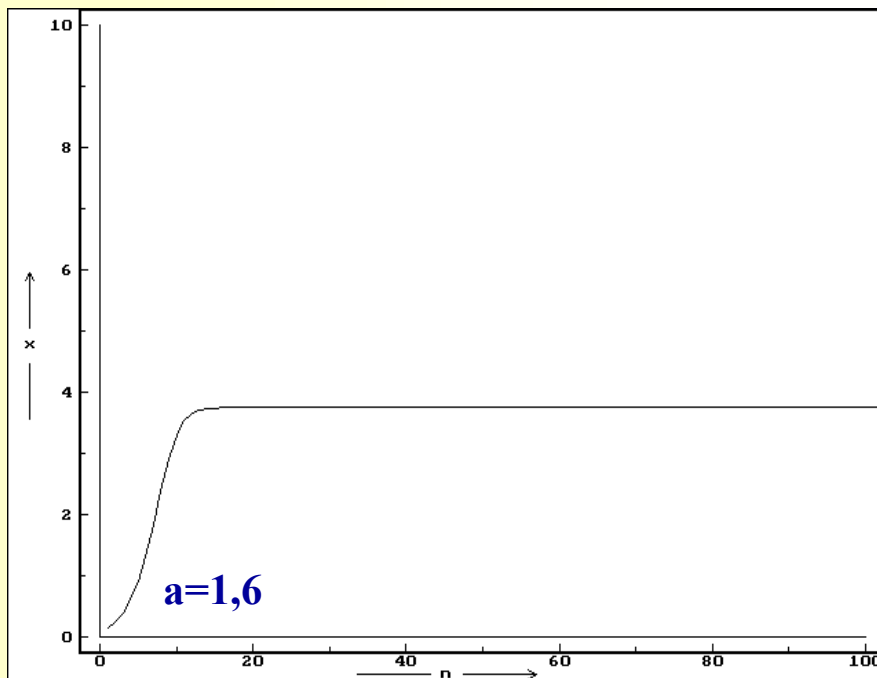
Vývoj populace

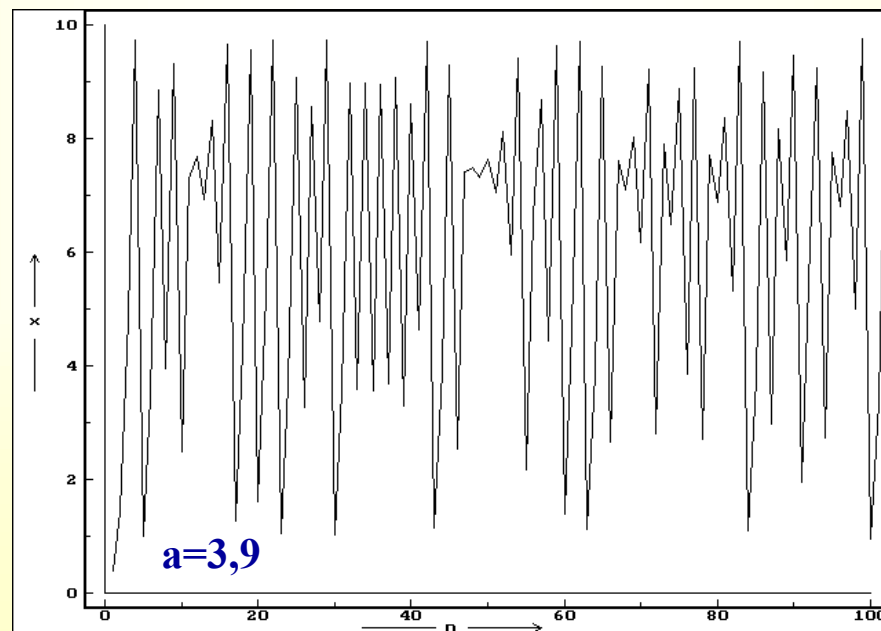
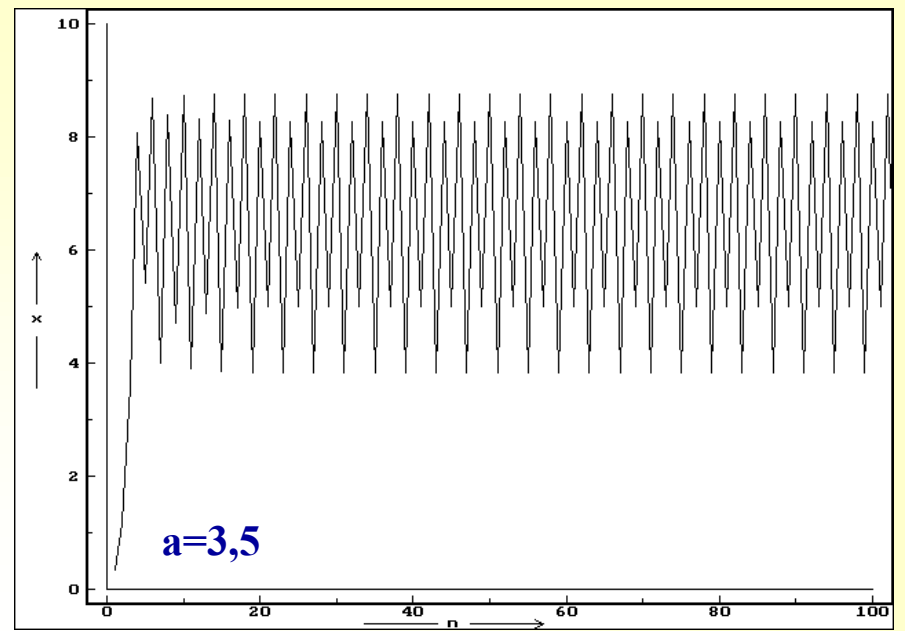
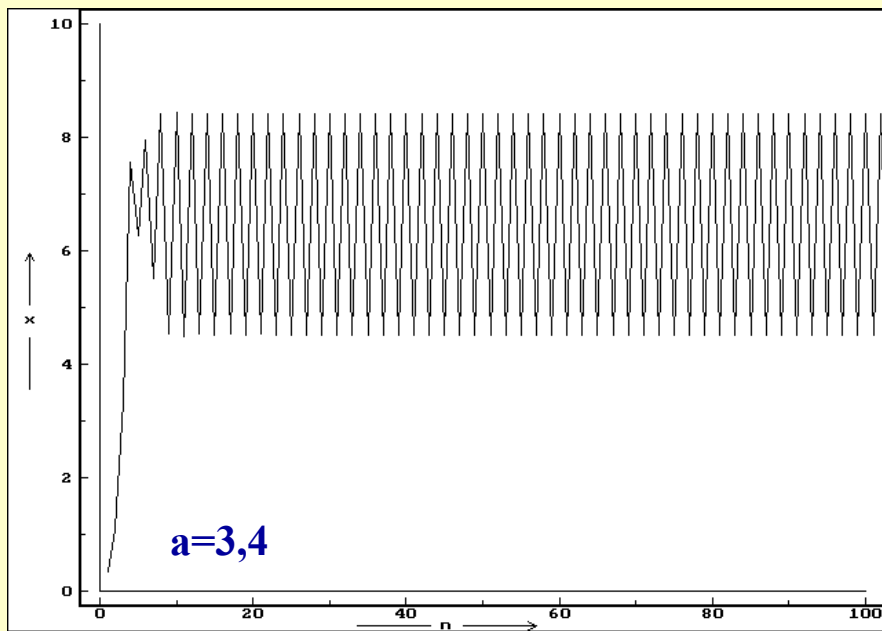
$$x_{n+1} = a \cdot x_n \cdot (1 - x_n / x_{\max})$$

x_n ... velikost populace v minulém roce

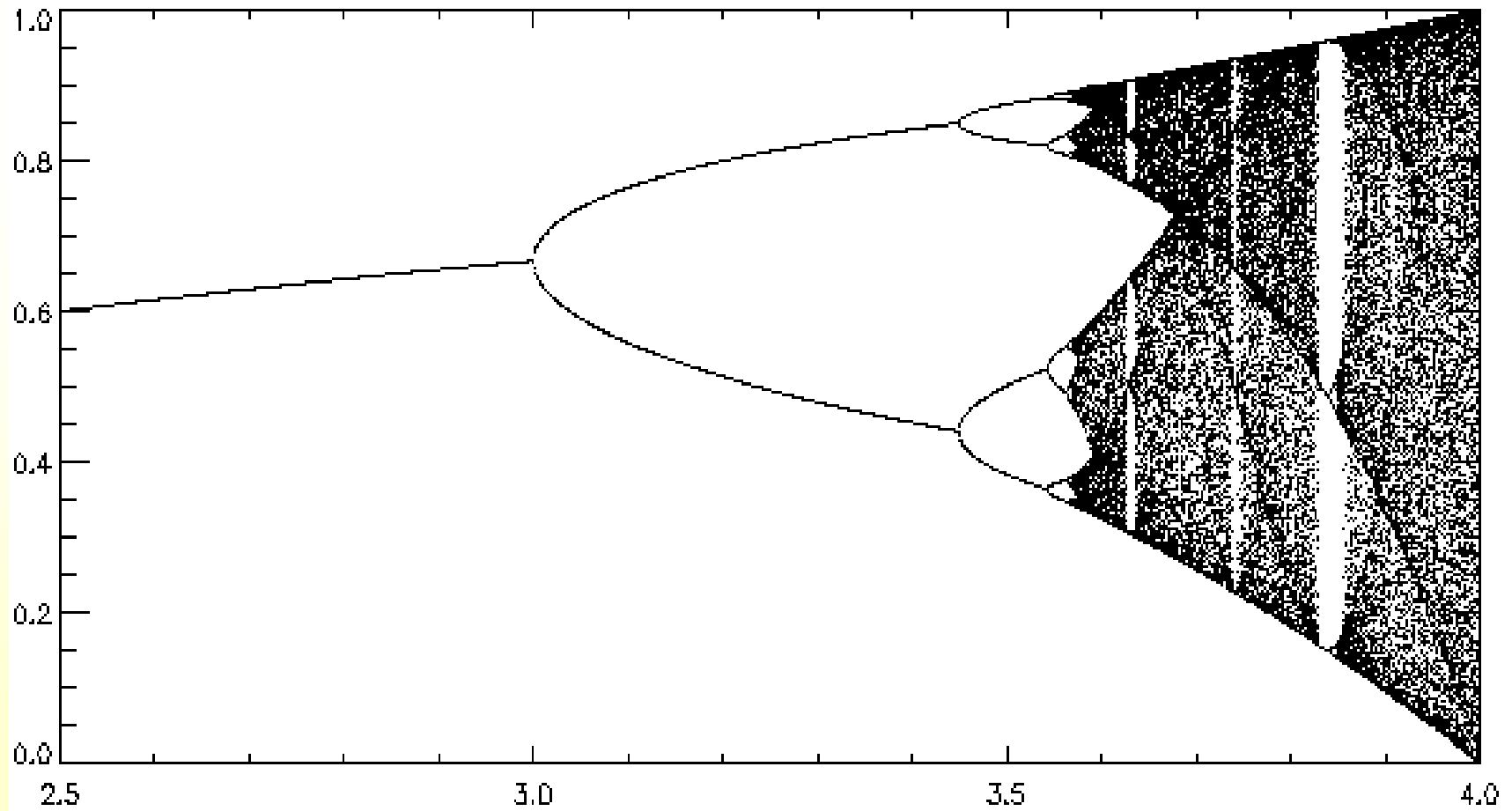
a ... konstanta určující rychlost reprodukce

x_{\max} ... maximální velikost populace

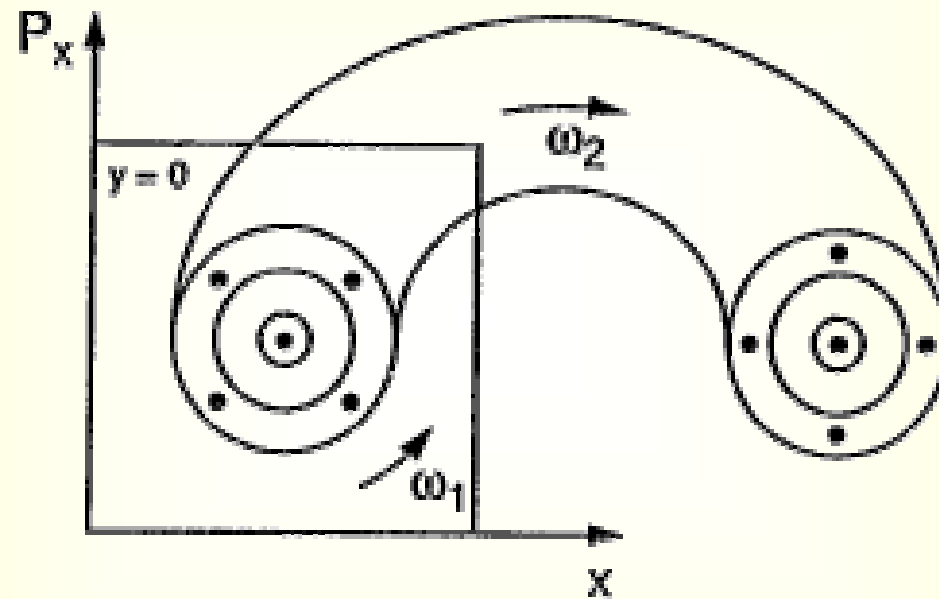




Bifurkace

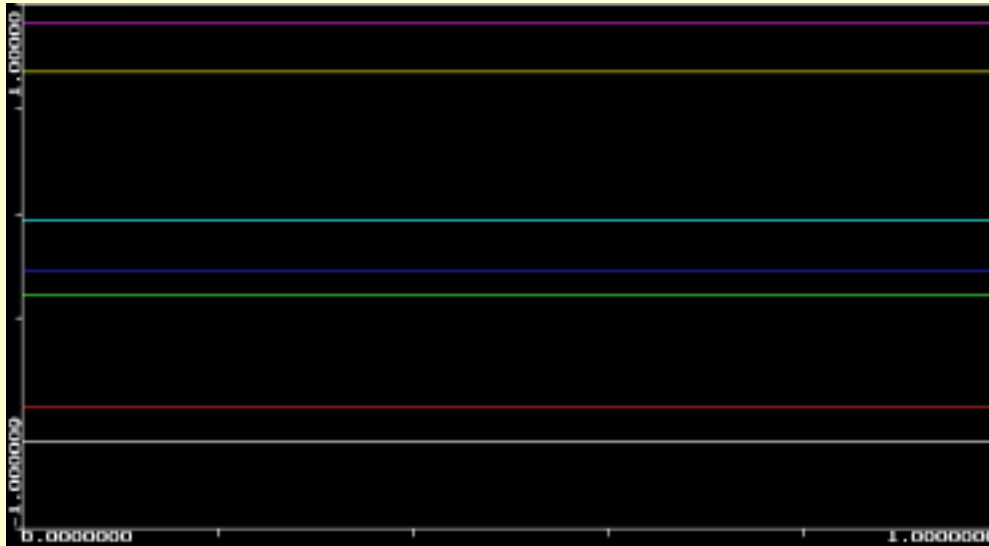


Fázový prostor



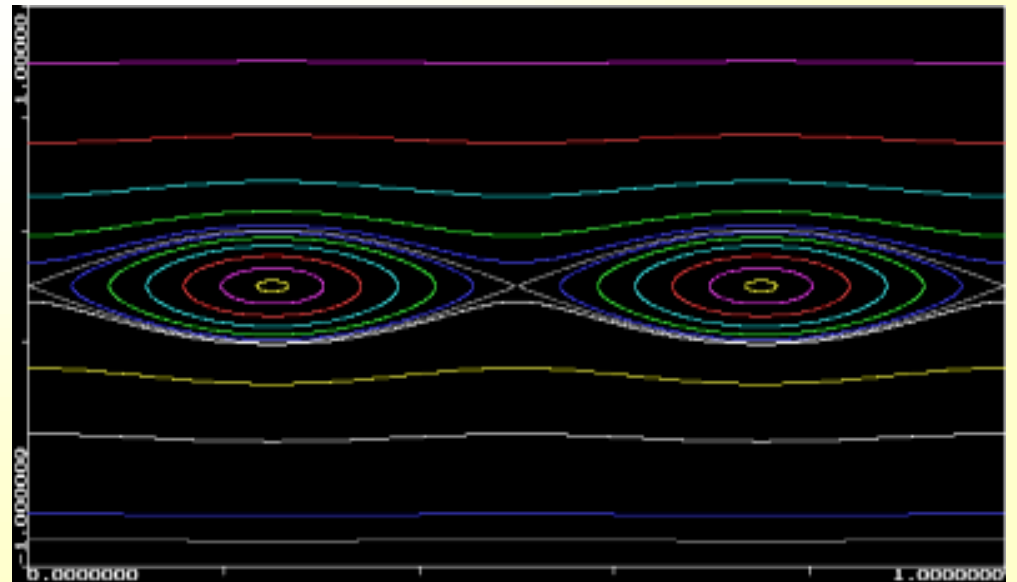
Poincarého mapy

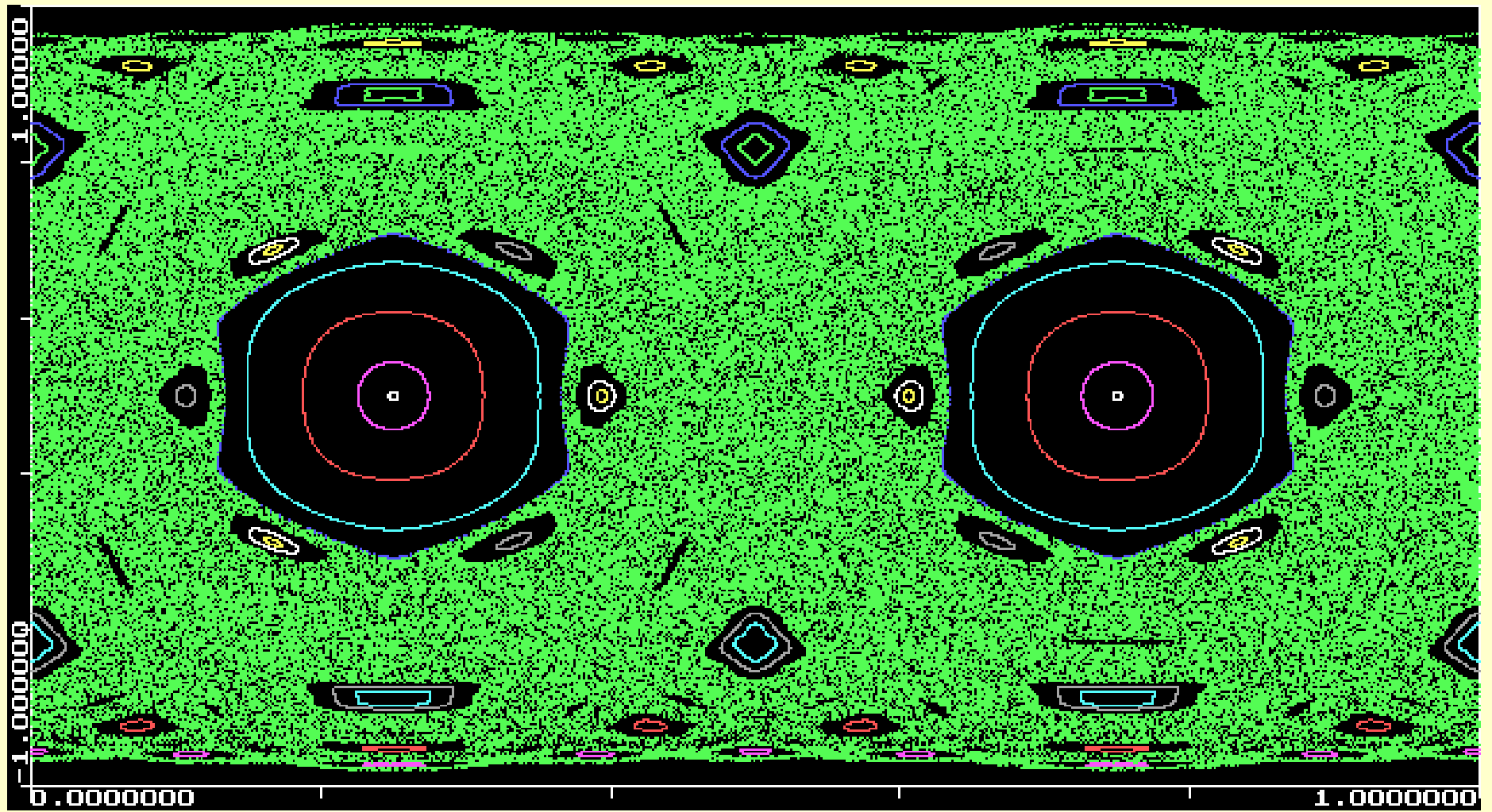
Billiard



kruh

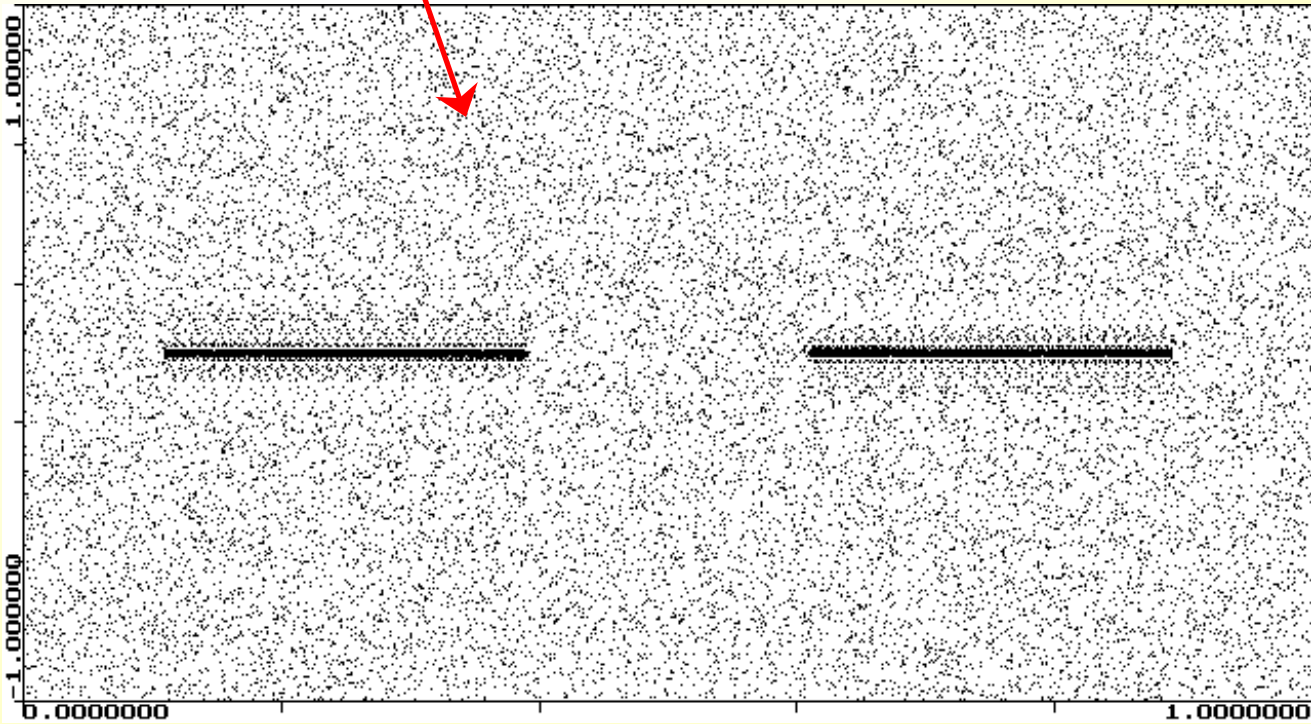
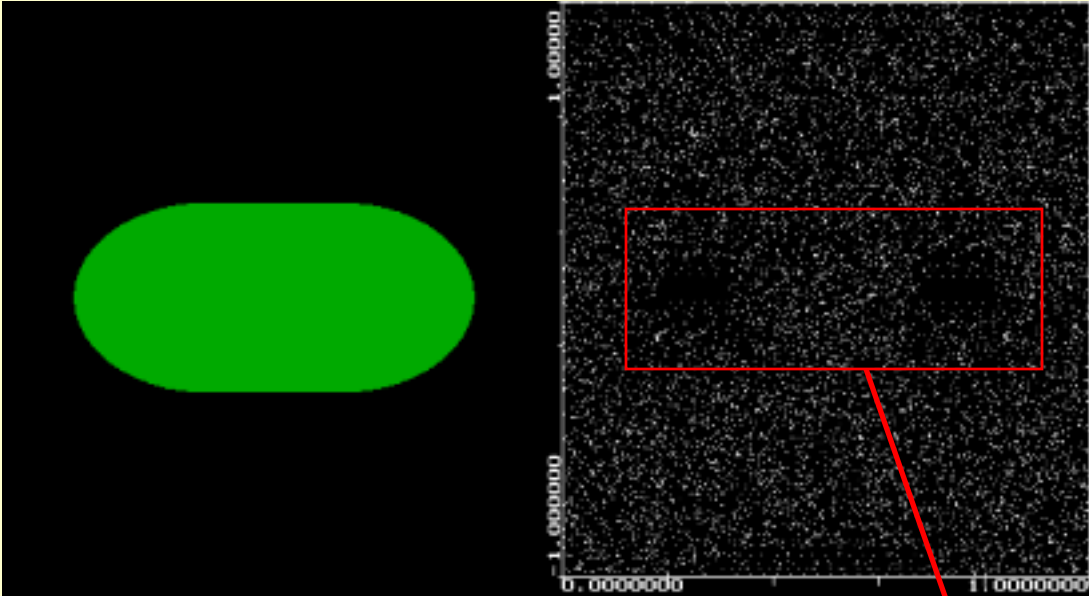
elipsa



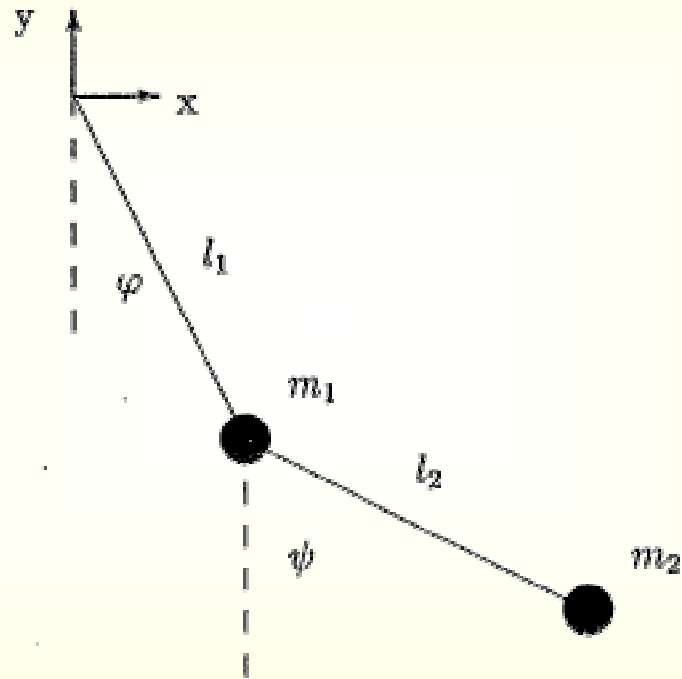


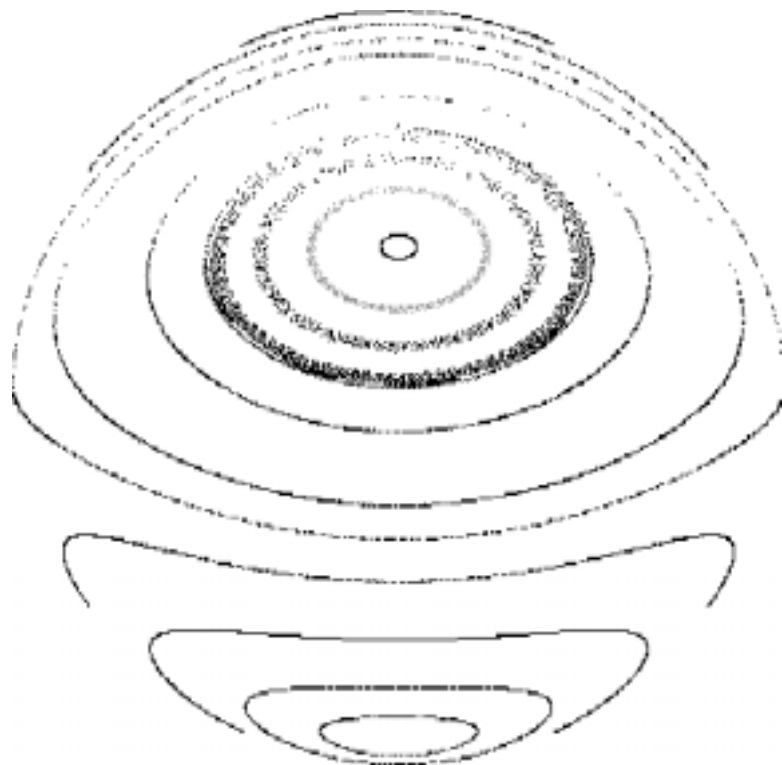
ovál

stadion



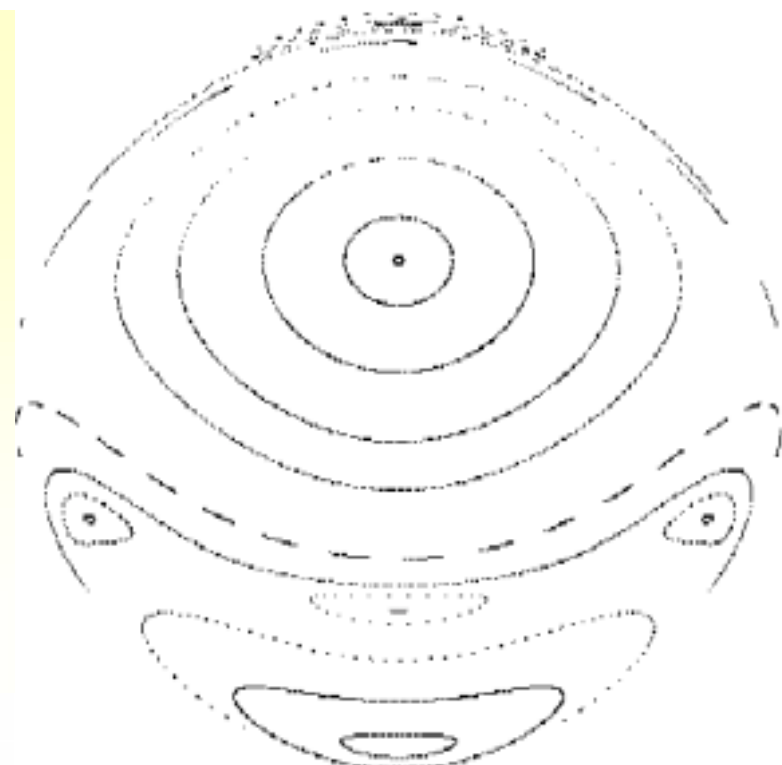
Dvojité kyvadlo



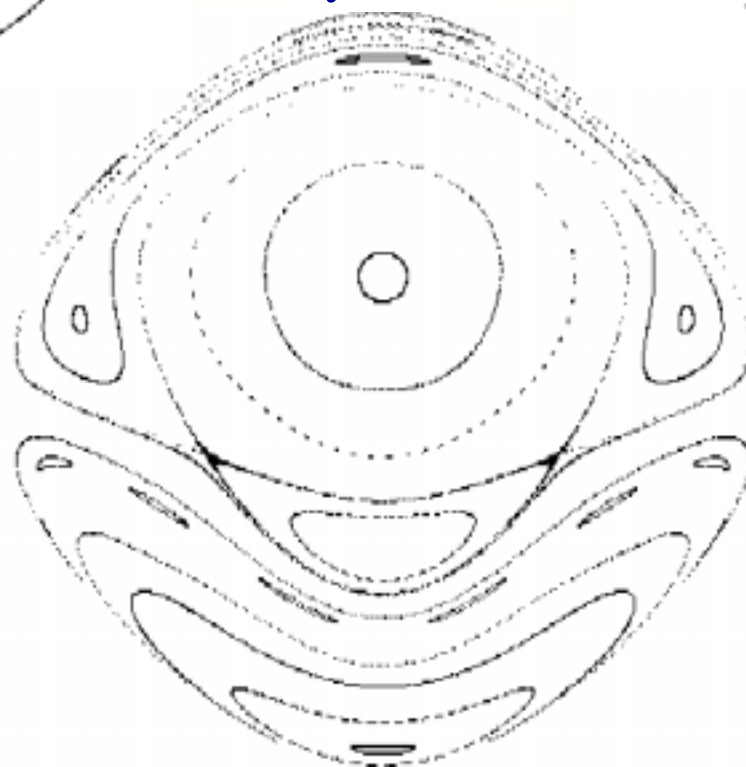


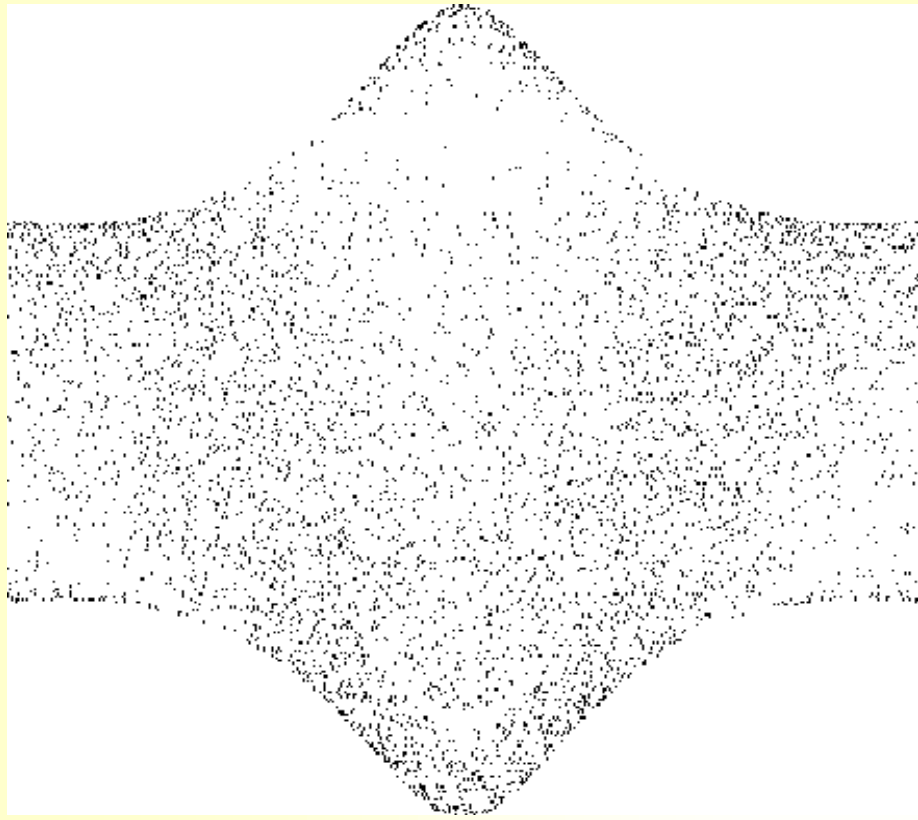
$E_t = 1 \text{ J}$

$E_t = 8 \text{ J}$



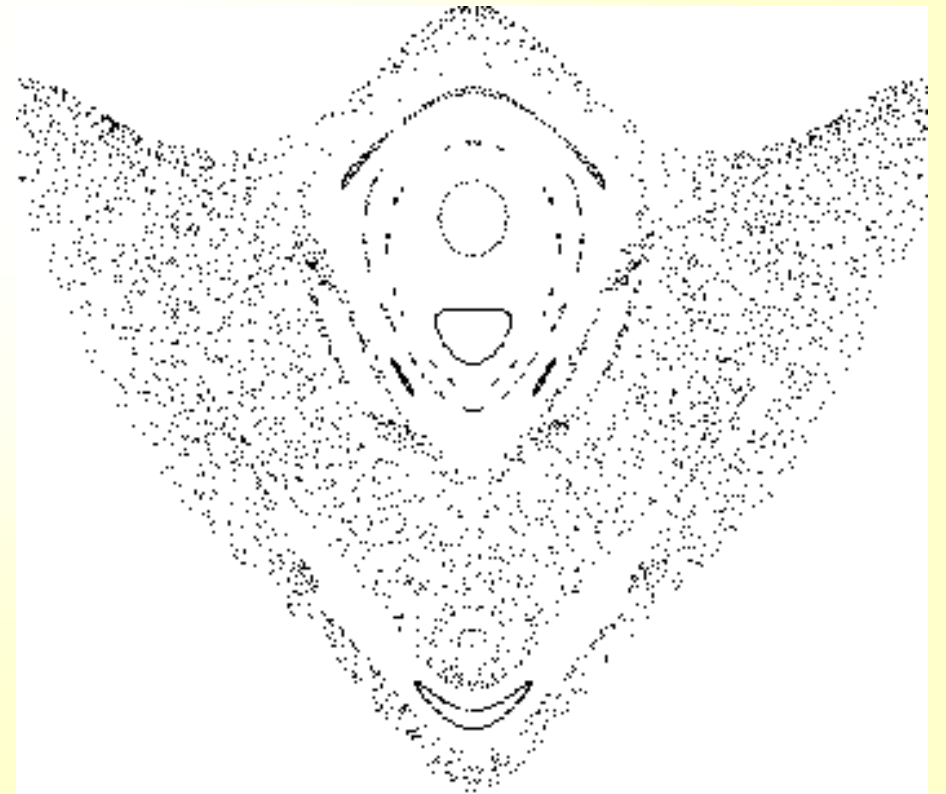
$E_t = 4 \text{ J}$





$E_t=50$ J

$E_t=120$ J



Shrnutí

- Druhy systémů z hlediska předpovídatelnosti
- Matematické modely chaosu
- Motýlí efekt
- Fázový prostor a Poincarého řezy

Poděkování

Ing. Petr Luft – supervizor projektu

Ing. Vojtěch Svoboda – řešitel technických problémů

Pořadatelé za scénou & sponzoři

Reference:

1. GLEICK, J. : *Chaos: Vznik nové vědy*, Ando Publishing, 1996
2. KORSCH H.J. – JODL H.-J.: *Chaos: A program collection for the PC*, Springer-Verlag Berlin Heidelberg, 1994