

# Chaotická dynamika

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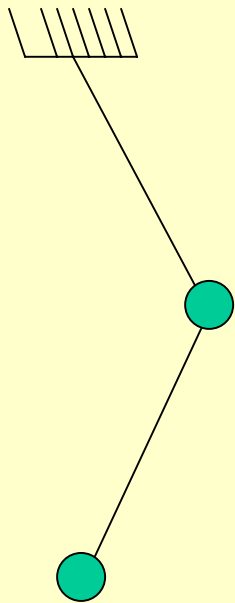
# Deterministický chaos

- determinismus
- pohybové rovnice
- řešení diferenciálních rovnic
- počítačové simulace

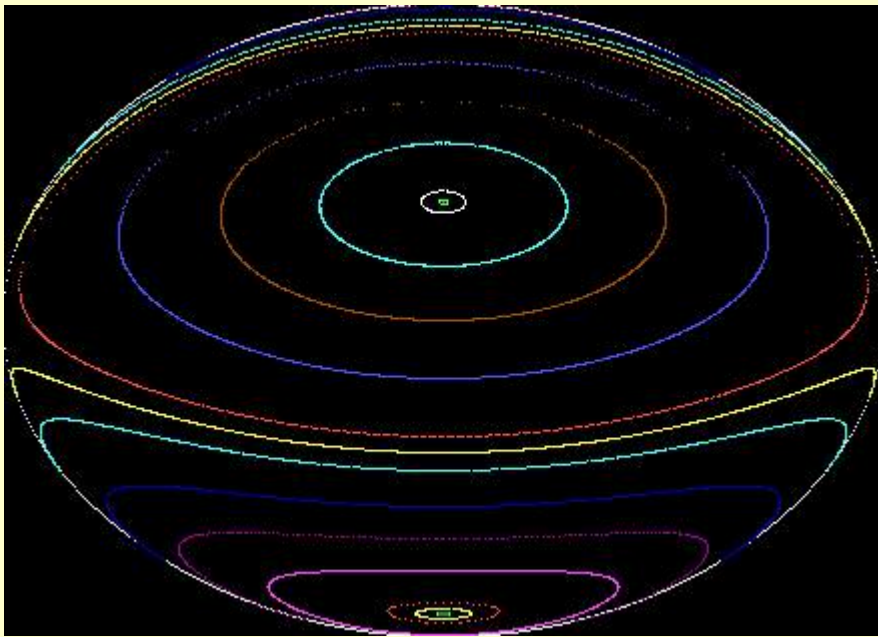
# Zkoumané systémy

1. Dvojité kyvadlo (double pendulum)
2. Nelineární elektrický obvod

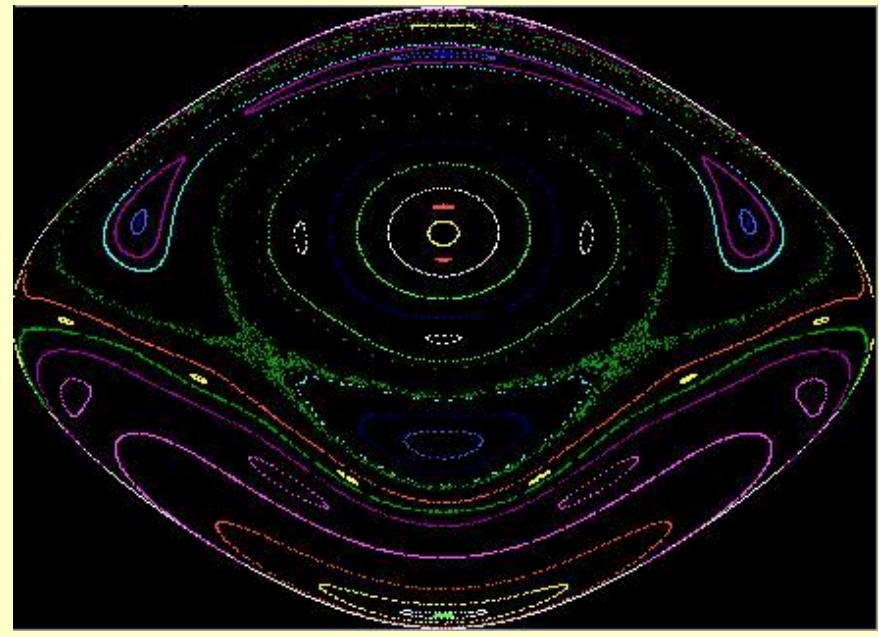
# Dvojité kyvadlo



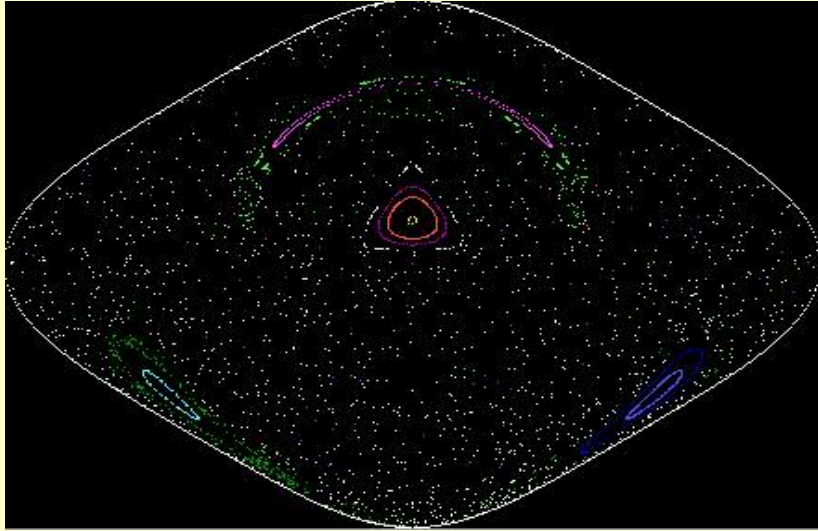
# Poincarého řez



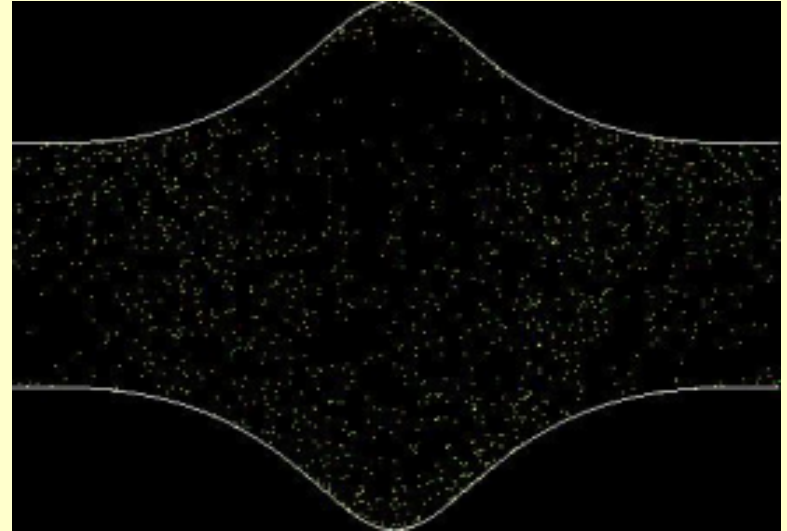
*1 J*



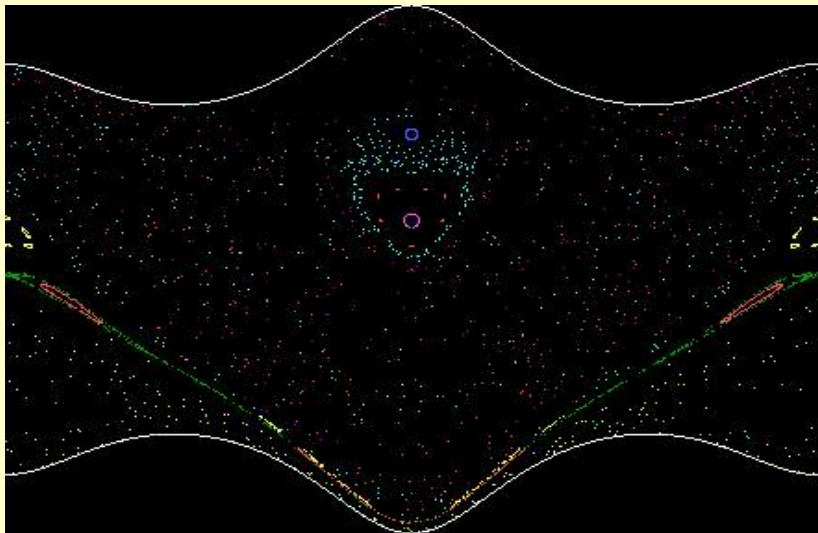
*10 J*



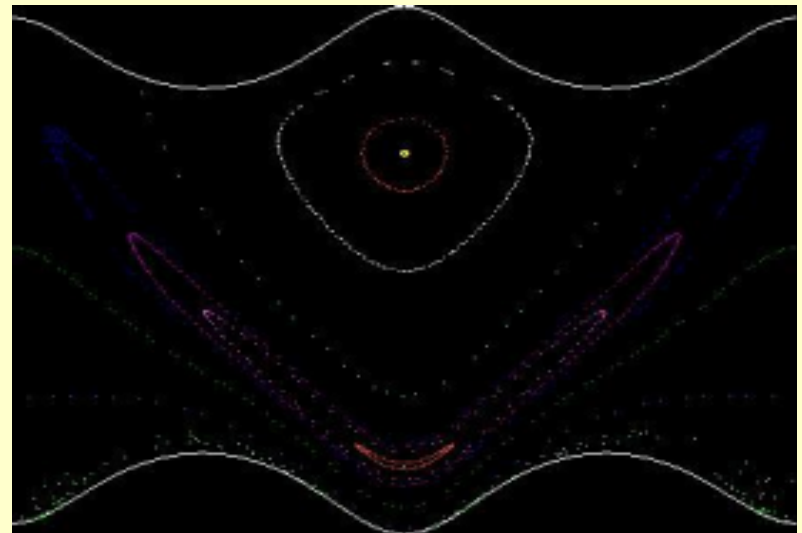
20 J



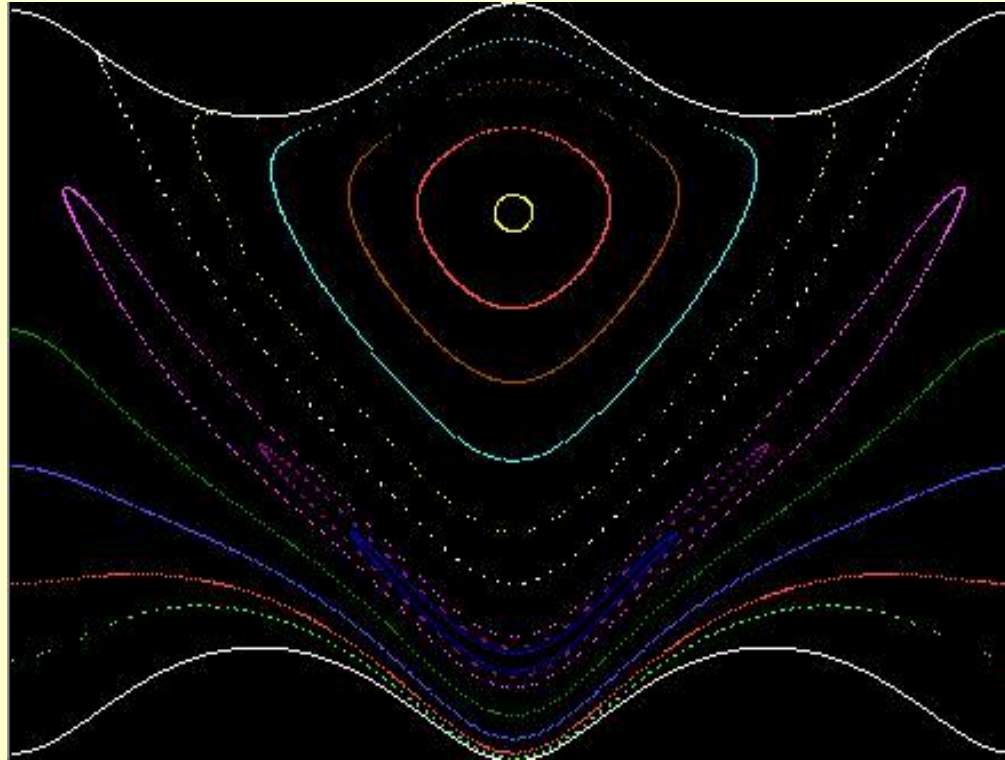
50 J



100 J

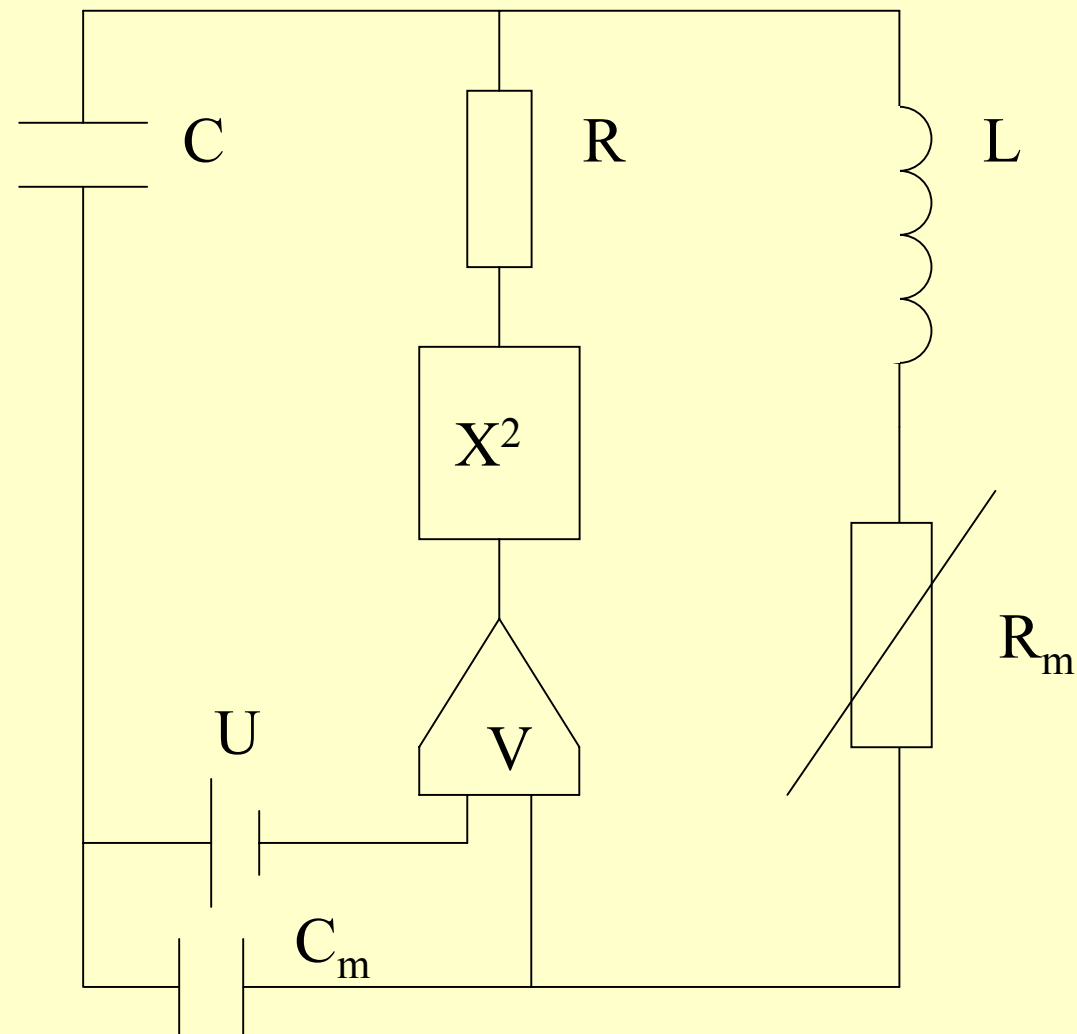


500 J



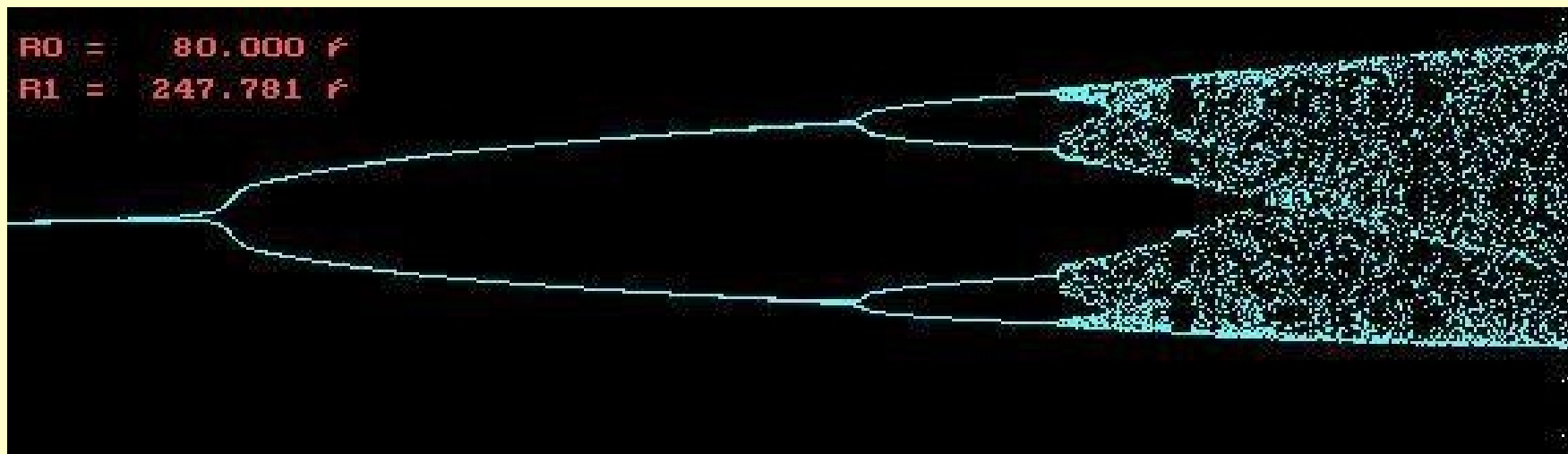
1000 J

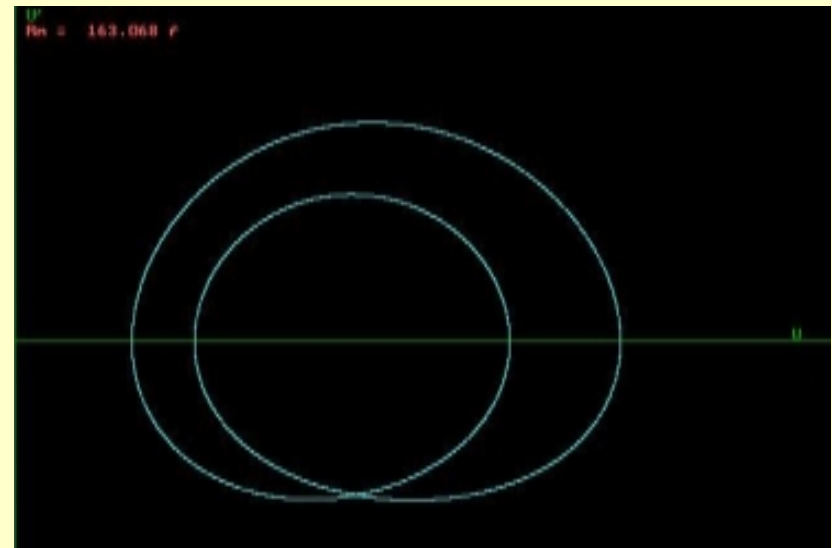
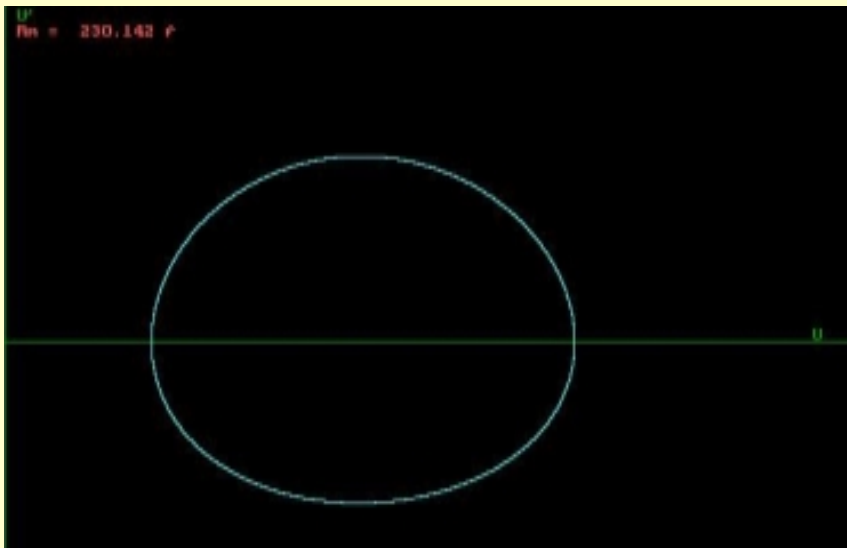
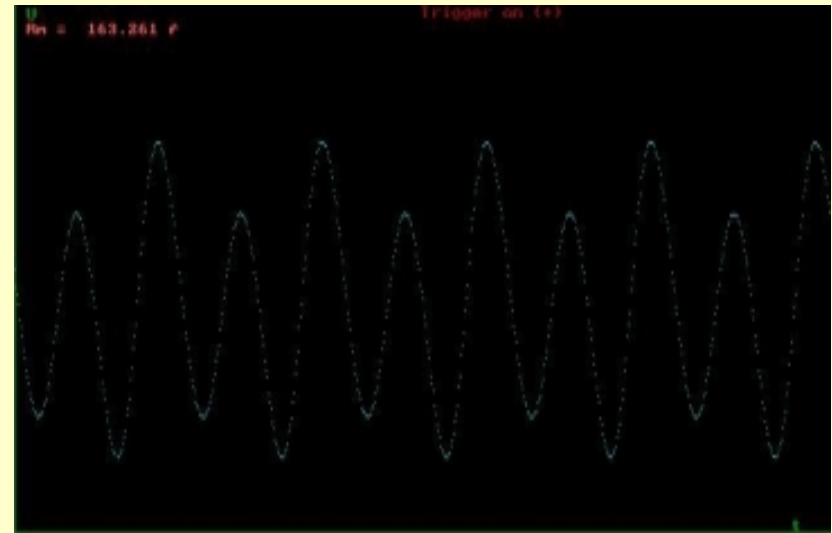
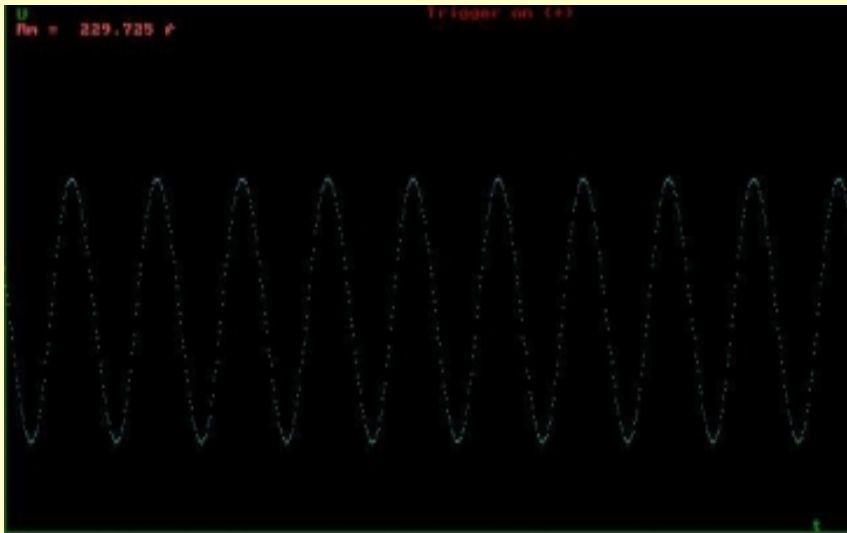
# Nelineární elektrický obvod





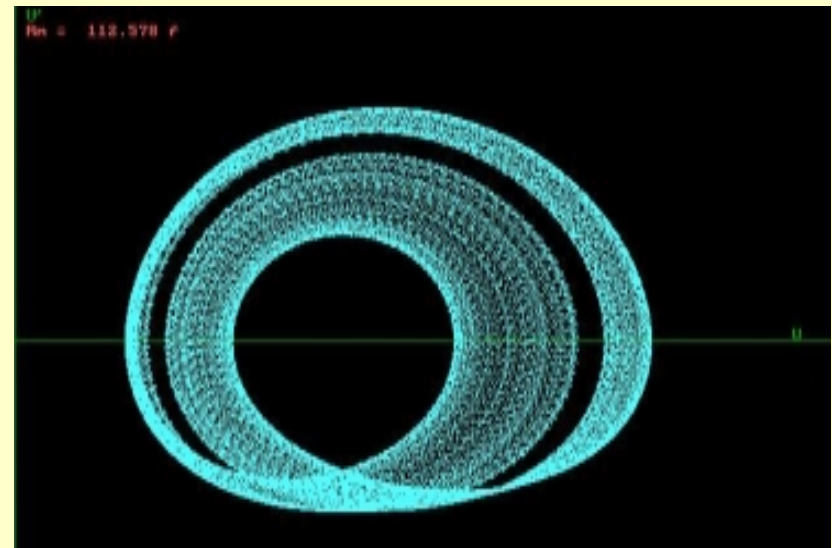
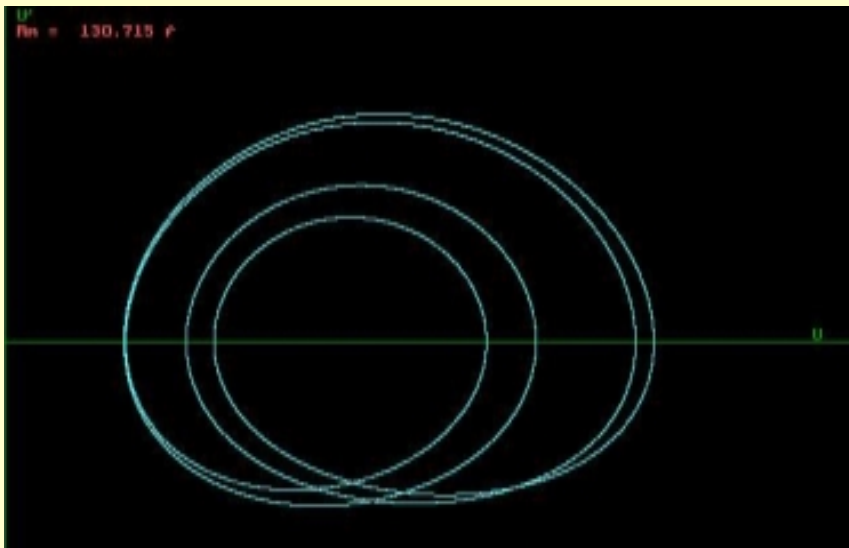
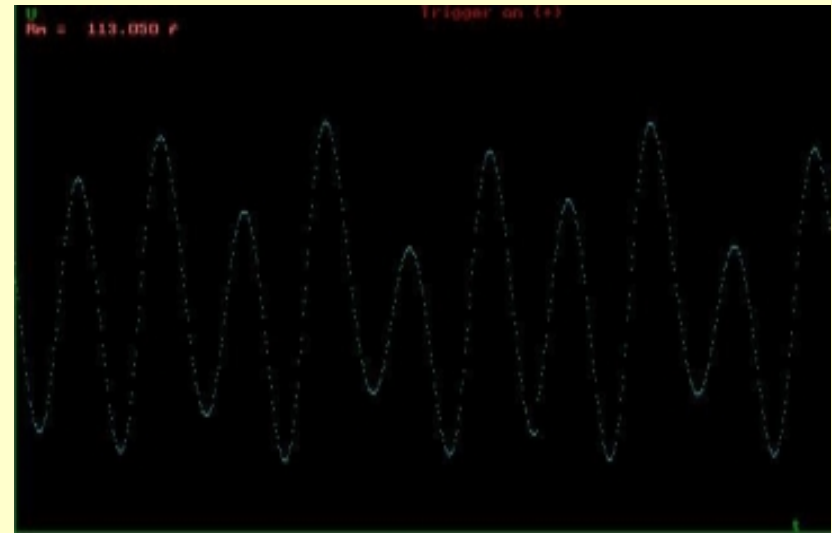
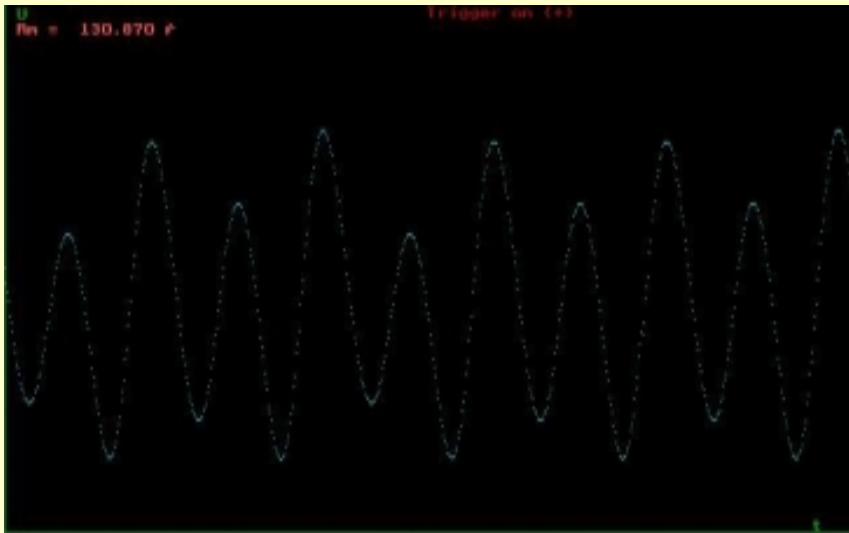
# Bifurkační diagram





230  $\Omega$

160  $\Omega$



130  $\Omega$

113  $\Omega$

# Závěr

- Určili jsme, pro které počáteční podmínky se systémy chovají chaoticky
- chaotická dynamika přináší důležité poznatky
- všechno je chaos