

Initial Conditions and Computations

Planet b: (0.71 +/-0.08 MJ)

$a=2.3 \pm 0.2$ AU

$e = ?$

$P = 1825 (\pm 365)$ d

Planet c: (0.27 +/- 0.03 MJ)

$a = 4.6 (\pm 0.5)$ AU

$e = 0.11$

$i = 59$ deg

$P = 5100 (\pm 730)$ d

Bulirsch-Stoer

FLI

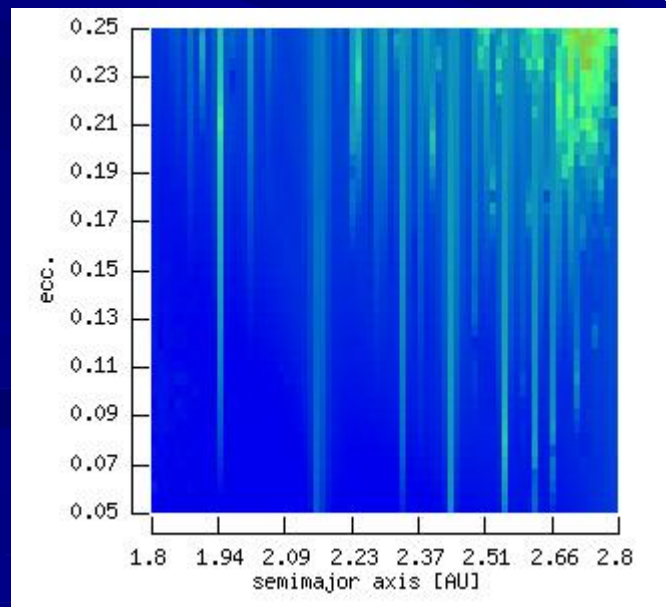
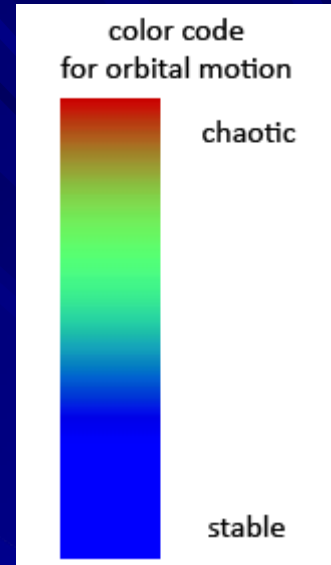
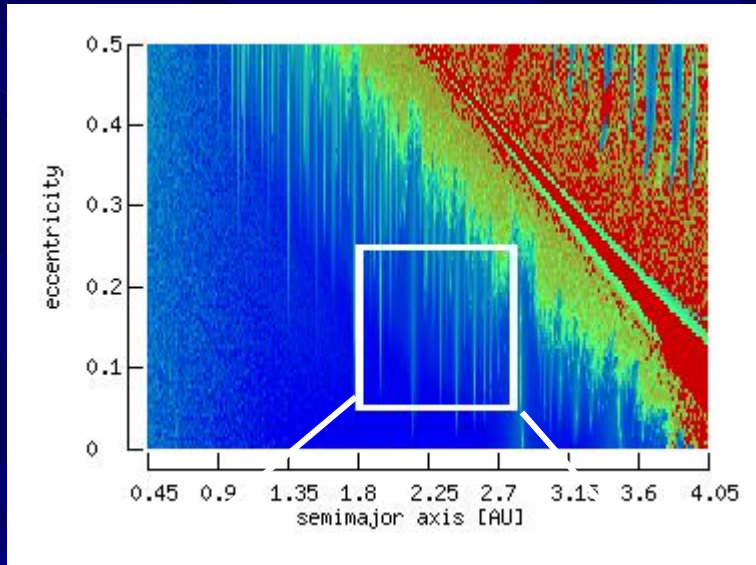
Integration time:

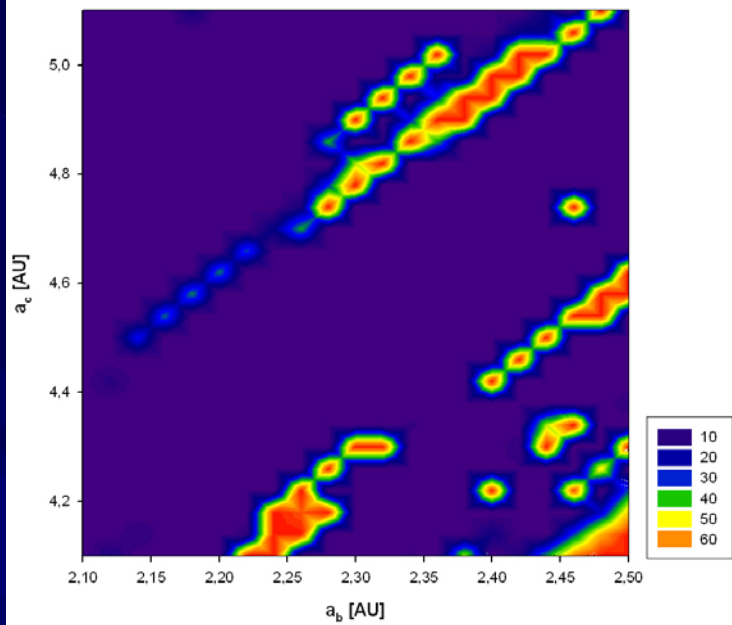
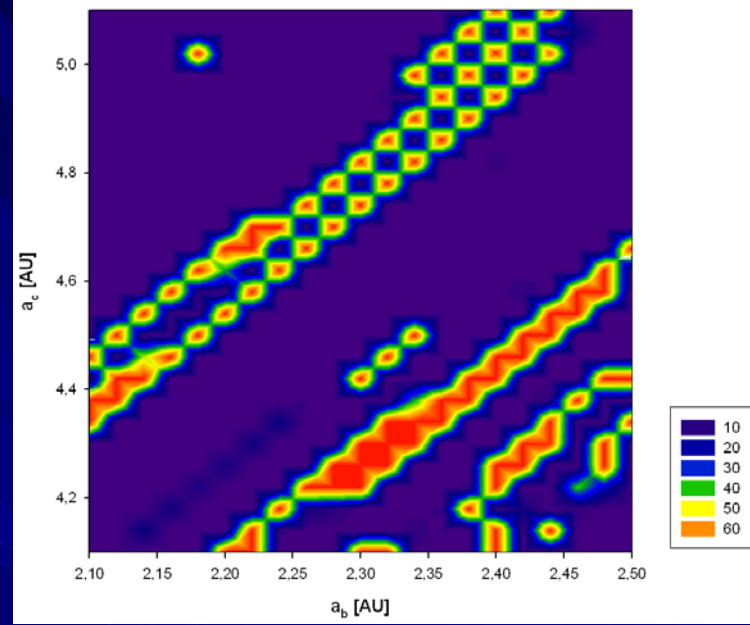
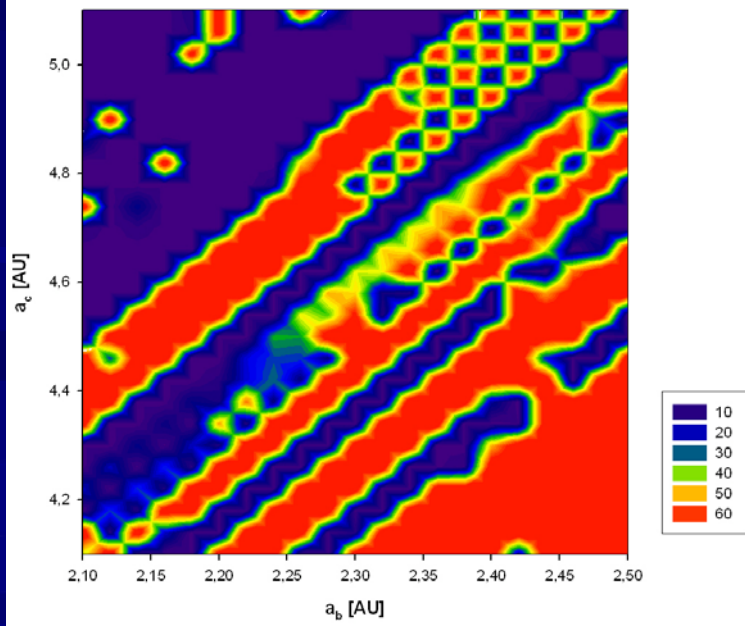
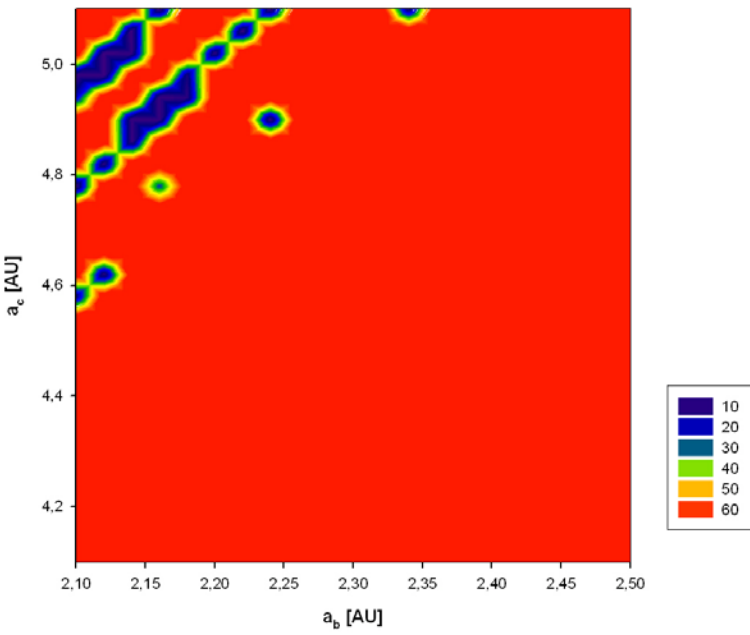
500000 years

HZ: maximum ecc.

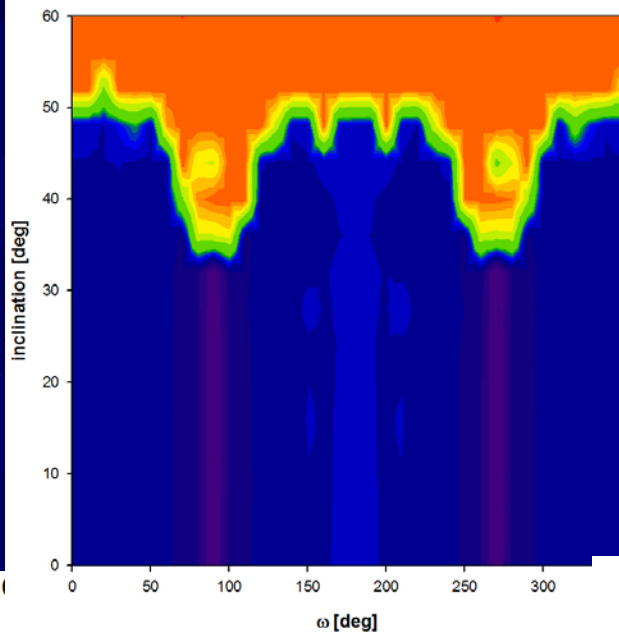
Testplanets in the HZ:

$a_{tp} = 0.2 \dots 0.4$ AU

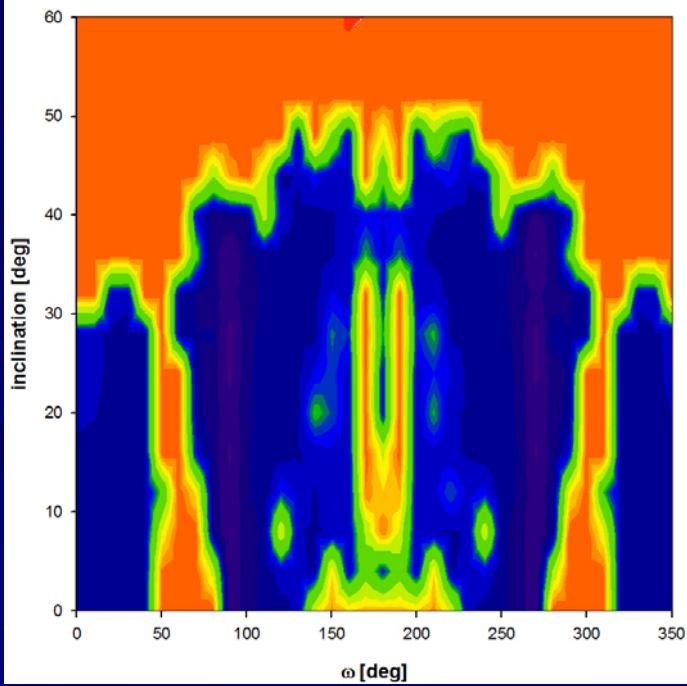


$i_c = 0^\circ$  $i_c = 40^\circ$  $i_c = 50^\circ$  $i_c = 60^\circ$ 

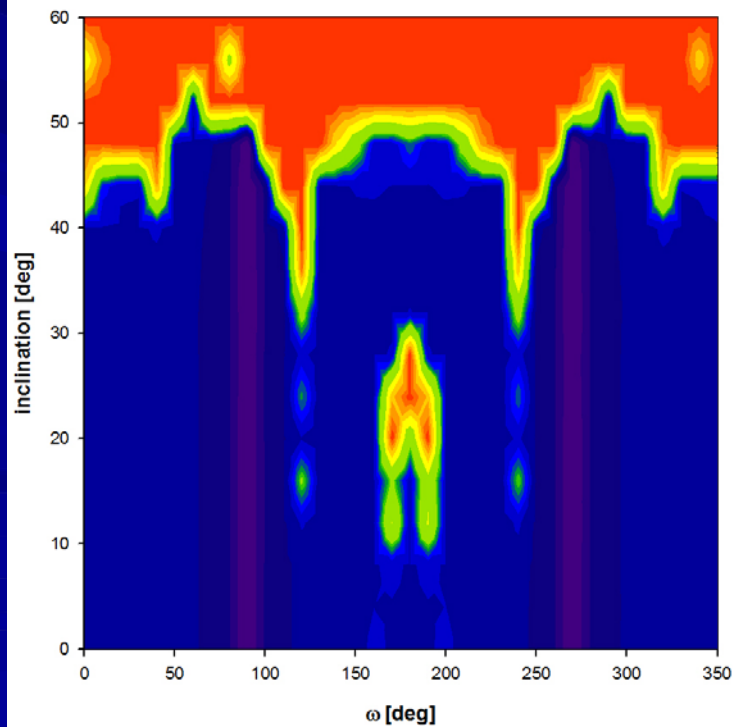
$a_b = 2.3 \text{ AU}$ $a_c = 4.6 \text{ AU}$ $e_b = 0.1$



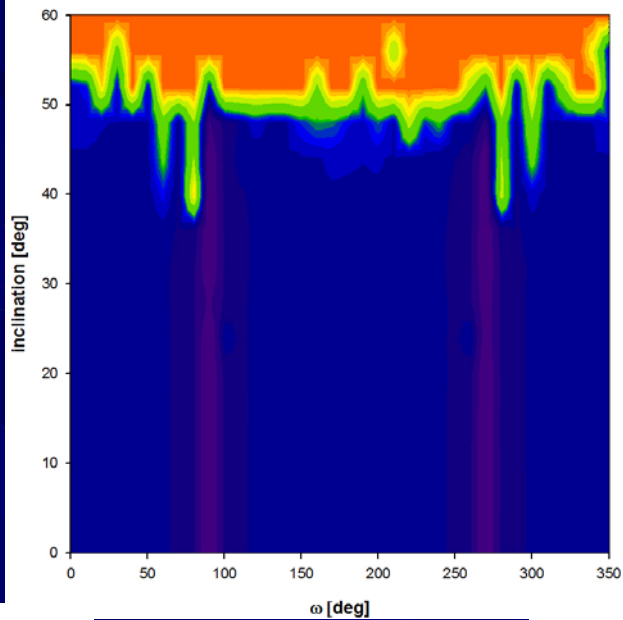
$a_b = 2.3 \text{ AU}$ $a_c = 4.1 \text{ AU}$ $e_b = 0.1$



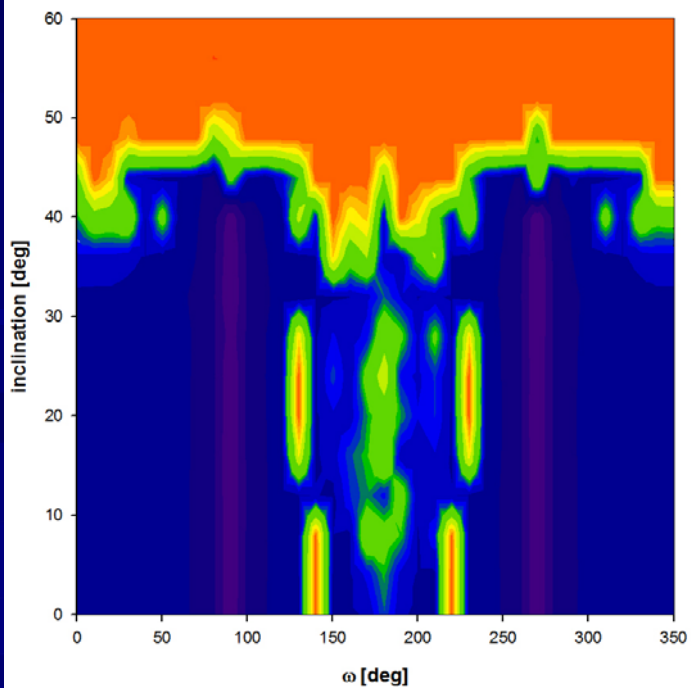
$a_b = 2.3 \text{ AU}$ $a_c = 5.1 \text{ AU}$ $e_b = 0.1$



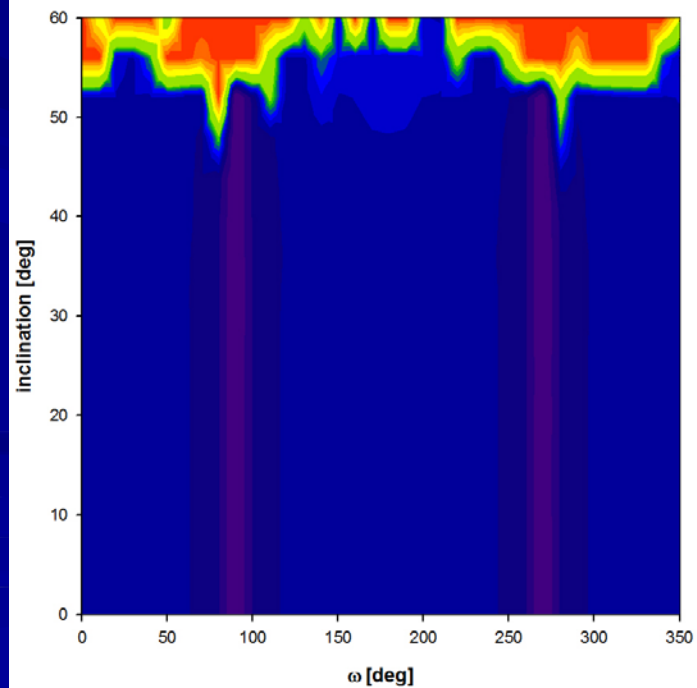
$a_b = 2.1 \text{ AU}$ $a_c = 4.6 \text{ AU}$ $e_b = 0.1$



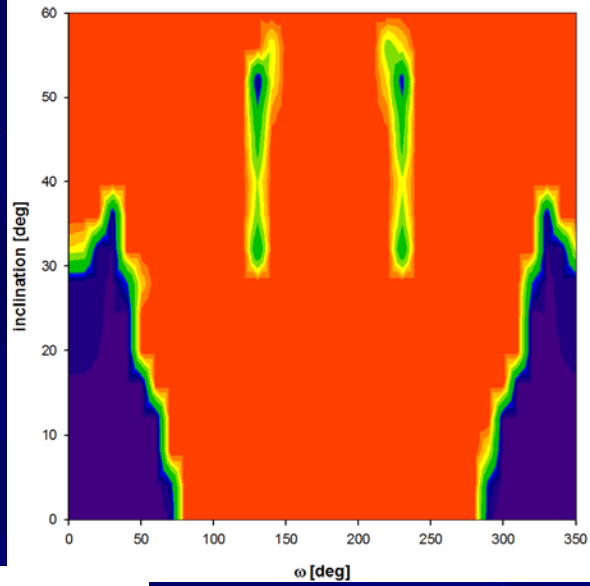
$a_b = 2.1 \text{ AU}$ $a_c = 4.1 \text{ AU}$ $e_b = 0.1$



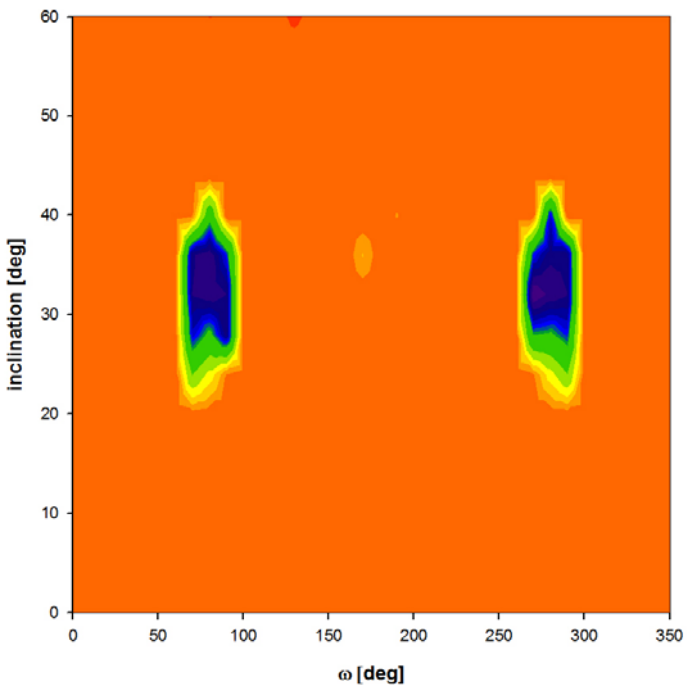
$a_b = 2.1 \text{ AU}$ $a_c = 5.1 \text{ AU}$ $e_b = 0.1$



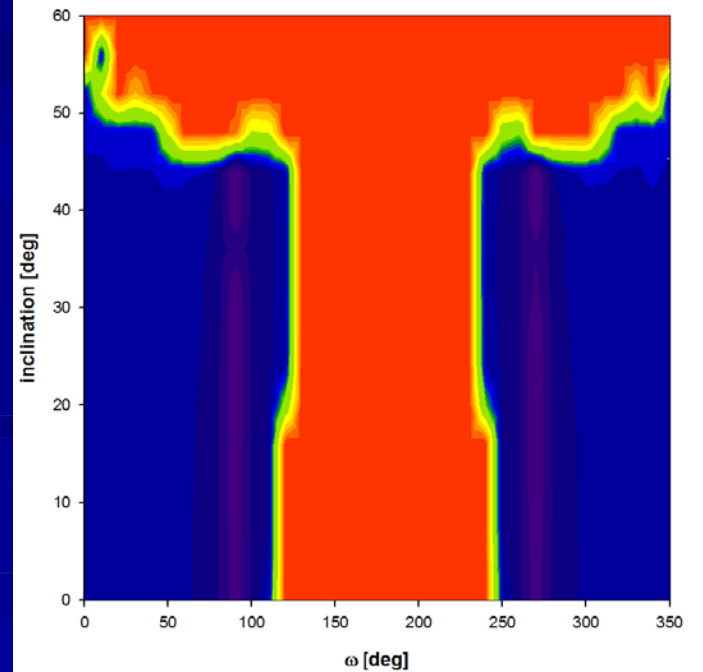
$a_b = 2.5 \text{ AU}$ $a_c = 4.6 \text{ AU}$ $e_b = 0.1$



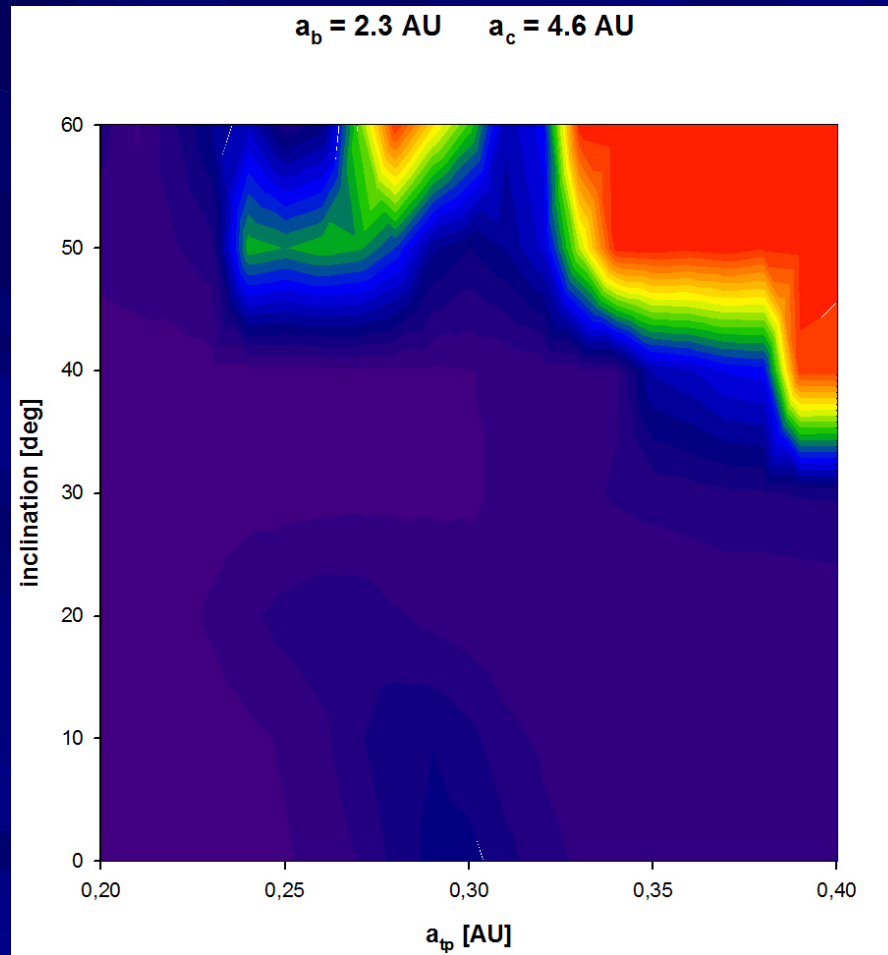
$a_b = 2.5 \text{ AU}$ $a_c = 4.1 \text{ AU}$ $e_b = 0.1$



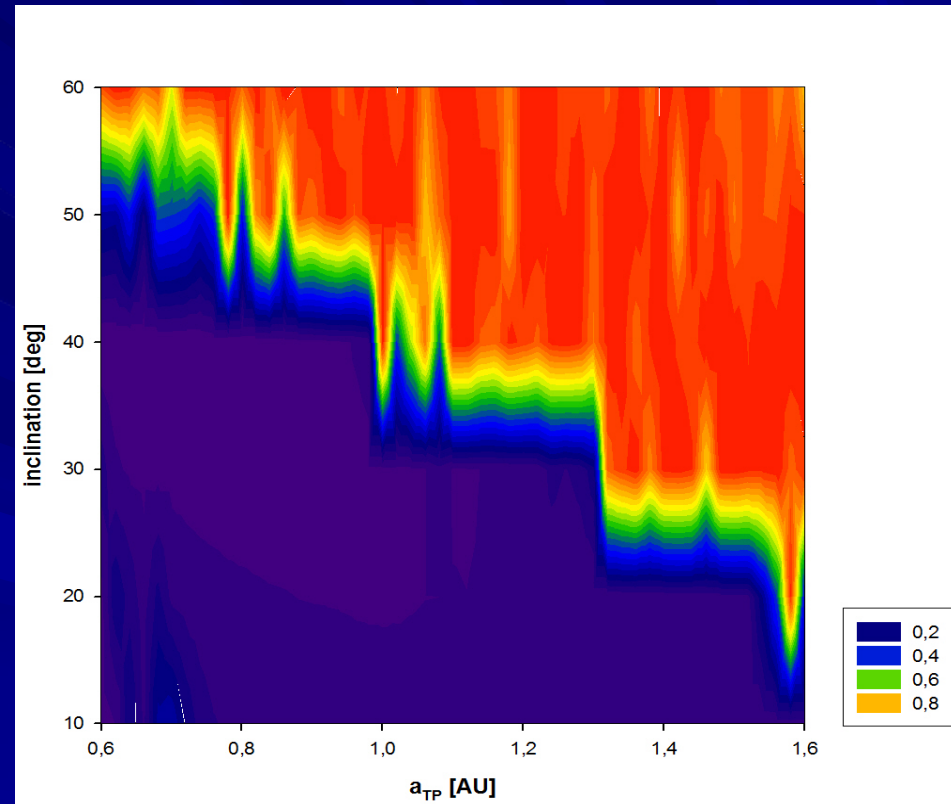
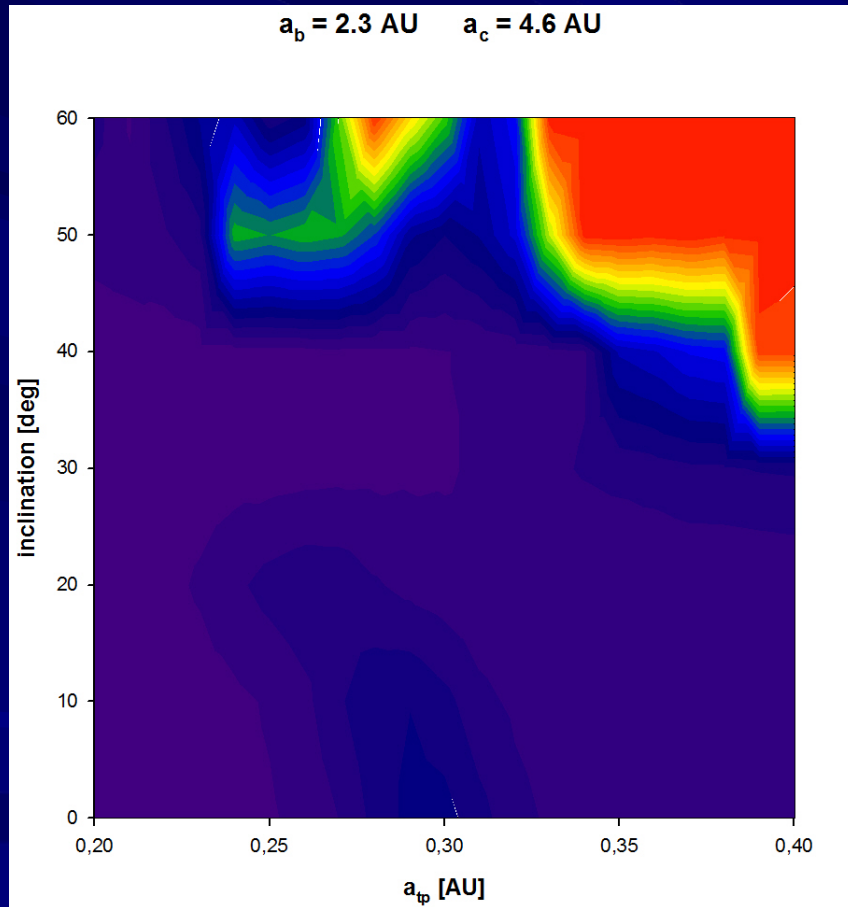
$a_b = 2.5 \text{ AU}$ $a_c = 5.1 \text{ AU}$ $e_b = 0.1$



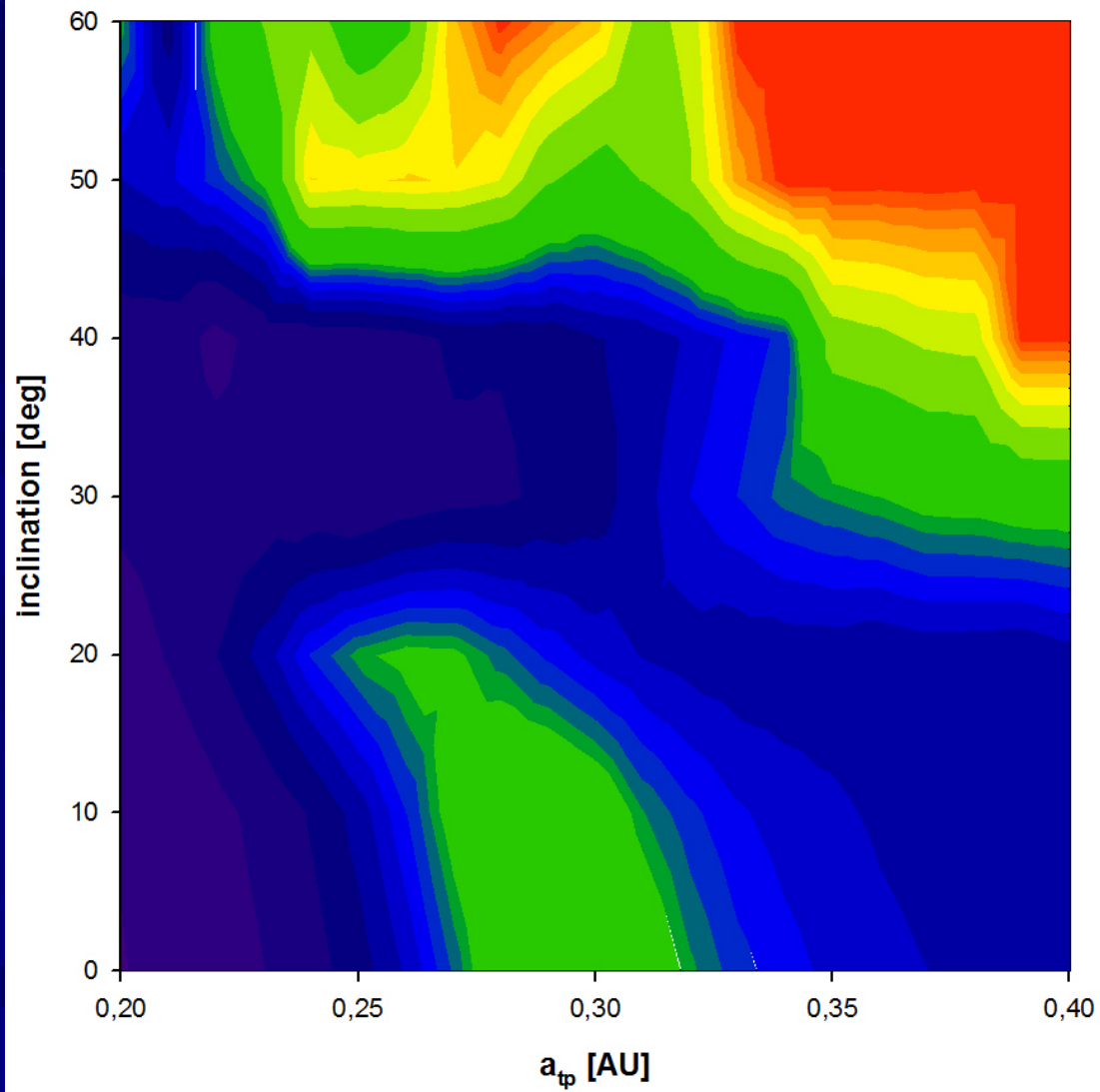
OGLE 06-109L



OGLE 06-109L ---- Jupiter-Saturn



$a_b = 2.3 \text{ AU}$ $a_c = 4.6 \text{ AU}$



Conclusion

- Stability of the system with such a high inclination i_c ?
- Stability for $i_c < 40\text{deg}$
- Planets in the HZ --- possible for a smaller i_c