

# ”Hundreds of new satellites of figure-eight orbit computed with high precision”

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Moore’s and Simo’s figure eight form a pair of solutions with equal topological power and very close  $T^*$  where one orbit is linearly stable, and the other is of hyperbolic-elliptic type. The two solutions have the following property: ”The stability angle of the elliptic eigenvalues of the elliptic-hyperbolic type solution is very close to the larger stability angle of the linearly stable solution and the larger hyperbolic eigenvalue of the elliptic-hyperbolic type solution is greater than one and very close to one”. 11 such pairs are observed in the found set of the solutions. The only pair for which one of the solution is choreography and the other is not, is Moore’s and Simo’s figure-8 pair. The other pairs include solutions which are both choreographies or both are not.

Elliptic eigenvalues - stability angles  $v_j$ , where  $\lambda_j = \exp(\pm 2\pi i v_j)$ ,  $j=1,2$

Hyperbolic eigenvalues -  $\lambda = \pm \exp(\pm \mu)$ , where  $\mu > 0$  (real)

$N$	$v_1$	$v_2$ ( $\lambda$ )
1.o	0.298092529004750122423759217553	0.00842272470813137798255957006197
2.o	0.297572835261762177616886515603	1.09587441937857035881716297118
168	0.40784890349106384337866469433	0.0019935128774804191847075312742
169	0.407878095243946342926399408327	1.01260411536962618608051911373
183	0.113906946482767933622664910797	0.000204847809204453673846810059986
182.o	0.113907351700580395421364175886	1.00128792082955666843679943641
184.o	0.321766297952400861501345817752	2.73443408190332171158835273135e-06
185	0.321766297894976627157266827548	1.00001718110363921020460648582
413	0.275011350174751332178664212923	0.00341516982815402730209182950586
414	0.274944611347846047797427400637	1.02168877842035886643036103128
516	0.419985465991861588825969387458	2.53711693697649396156909239048e-05
517	0.419985464895451330747279070436	1.00015942446499820482272533202
566(7)	0.0510448387685393038619167549197	0.000470536861501385808885643455201
568(9)	0.0511035333412229240163190648031	1.00295760622497888501704572619
602	0.486970420626426013258486704454	1.57783479465699085471836250548e-10
601	0.48697042062642601225914847037	1.00000000099138284038597245085
710	0.362106684842480412831481000468	5.4254102403482686231779425702e-05
709	0.362106691527735086211661724738	1.00034094667194577520289810905
812	0.000271405431881764307622275642029	2.62714627575304455374171942221e-05
811	0.000271545986591109932335614622619	1.00016501649085496613052617652
816	0.0569778172452586429455727714835	1.84519912717157249707071014081e-11
815	0.0569778172452586429470759015314	1.00000000011593728045337094242