Semiparametric transformation model: a hierarchical Bayesian approach

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Appendix OpenBugs code (example 1)

```
model {
for (i in 1:N) {
zeros[i] <- 0
phi[i] <- - loglike[i]
zeros[i] ~ dpois(phi[i])
loglike[i]<- delta[i]*treatment[i]*beta + delta[i]*log(lambda[i])
-exp(beta*treatment[i])*Lambda[i]
Lambda[i] <- lambda[i]*t[i]
lambda[i] ~ dgamma(1, tau.lambda)
}
beta <- log(theta)
theta ~ dgamma(45,10)
tau.lambda ~ dunif(0.00011,1000)
}
list(t=c(6,6,6,7,10,13,16,22,23,6,9,10,11,17,19,20,25,32,32,34,35,
1,1,2,2,3,4,4,5,5,8,8,8,8,11,11,12,12,15,17,22,23),
delta=c(1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,1),treatment=c(1,1,1,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,
2,2,2,2,2,2),N = 42)
```

	mean	sd	MC error	$val2.5pc$	median	$val97.5pc$	start	sample
β	1.535	0.1392	0.004709	1.254	1.538	1.809	11000	1000
$\lambda[1]$	0.01147	0.009335	2.512E-4	0.001339	0.008969	0.03706	11000	1000
$\lambda[2]$	0.01125	0.009085	3.045E-4	0.001113	0.00865	0.03673	11000	1000
$\lambda[3]$	0.01144	0.009098	2.473E-4	0.001184	0.008995	0.03552	11000	1000
$\lambda[4]$	0.01077	0.008565	3.148E-4	0.0112	0.008618	0.03411	11000	1000
$\lambda[5]$	0.01033	0.008373	2.213E-4	0.001162	0.007903	0.03125	11000	1000
$\lambda[6]$	0.009609	0.008014	2.851E-4	9.31E-4	0.007702	0.02945	11000	1000
$\lambda[7]$	0.008797	0.006653	1.973E-4	0.001205	0.006956	0.02562	11000	1000
$\lambda[8]$	0.007945	0.006153	1.797E-4	9.888E-4	0.00635	0.02506	11000	1000
$\lambda[9]$	0.07773	0.006147	2.014E-4	7.788E-4	0.006428	0.0233	11000	1000
$\lambda[10]$	0.005884	0.006343	2.333E-4	1.337E-4	0.003938	0.02191	11000	1000
$\lambda[11]$	0.005608	0.005931	1.622E-4	1.149E-4	0.003736	0.02241	11000	1000
$\lambda[12]$	0.005279	0.006139	2.124E-4	1.487E-4	0.003538	0.01839	11000	10000
$\lambda[13]$	0.00522	0.005553	1.884E-4	1.225E-4	0.003398	0.02104	11000	1000
$\lambda[14]$	0.004345	0.004407	1.468E-4	1.495E-4	0.002838	0.01603	11000	1000
$\lambda[15]$	0.004493	0.004991	2.147E-4	1.101E-4	0.00293	0.01872	11000	1000
$\lambda[16]$	0.004212	0.004754	1.485E-4	1.334E-4	0.002692	0.01826	11000	1000
$\lambda[17]$	0.003716	0.003895	1.132E-4	9.666E-4	0.002569	0.01343	11000	1000
$\lambda[18]$	0.003324	0.003451	1.176E-4	8.93E-4	0.002225	0.01343	11000	1000
$\lambda[19]$	0.003213	0.003558	1.032E-4	8.151E-4	0.002193	0.01255	11000	1000
$\lambda[20]$	0.003231	0.003275	1.103E-4	9.002E-4	0.002268	0.01219	11000	1000
$\lambda[21]$	0.003035	0.003207	9.458E-4	6.172E-4	0.00204	0.01146	11000	1000
$\lambda[22]$	0.01237	0.01103	3.326E-4	0.001283	0.009453	0.04016	11000	1000
$\lambda[23]$	0.01181	0.009818	2.946E-4	0.001185	0.009023	0.03796	11000	1000
$\lambda[24]$	0.01026	0.008497	3.164E-4	9.199E-4	0.008101	0.03333	11000	1000
$\lambda[25]$	0.01089	0.008872	2.242E-4	0.001128	0.008577	0.0339	11000	1000
$\lambda[26]$	0.009593	0.007552	2.005E-4	9.424E-4	0.007613	0.03029	11000	1000
$\lambda[27]$	0.008442	0.006456	2.069E-4	8.733E-4	0.007019	0.02573	11000	1000
$\lambda[28]$	0.008525	0.00657	1.825E-4	9.796E-4	0.006875	0.02476	11000	1000
$\lambda[29]$	0.007682	0.006066	1.715E-4	0.097E-4	0.006332	0.02302	11000	1000
$\lambda[30]$	0.008096	0.006574	2.225E-4	8.269E-4	0.006488	0.0253	11000	1000
$\lambda[31]$	0.00646	0.004988	1.606E-4	6.639E-4	0.05228	0.02093	11000	1000
$\lambda[32]$	0.00615	0.00499	1.593E-4	6.157E-4	0.004864	0.02025	11000	1000
$\lambda[33]$	0.006383	0.005067	1.841E-4	7.0E-4	0.005073	0.0203	11000	1000
$\lambda[34]$	0.005939	0.004922	1.718E-4	5.938E-4	0.004573	0.01905	11000	1000
$\lambda[35]$	0.005357	0.004212	1.519E-4	5.977E-4	0.00422	0.01632	11000	1000
$\lambda[36]$	0.005603	0.004387	1.167E-4	6.897E-4	0.004532	0.01781	11000	1000
$\lambda[37]$	0.004996	0.003935	1.04E-4	6.001E-4	0.003978	0.01563	11000	1000
$\lambda[38]$	0.005128	0.00388	1.629E-4	6.418E-4	0.004238	0.01492	11000	1000
$\lambda[39]$	0.004238	0.003385	1.061E-4	4.567E-4	0.003498	0.001322	11000	1000
$\lambda[40]$	0.00398	0.002997	9.858E-5	4.077E-4	0.003296	0.01189	11000	1000
$\lambda[41]$	0.003313	0.002697	8.58E-5	2.706E-4	0.002657	0.01022	11000	1000
$\lambda[42]$	0.003365	0.002622	8.005E-5	3.199E-4	0.002722	0.01024	11000	1000
$\tau.\lambda$	163.6	57.36	1.865	77.1	156.5	292.3	11000	1000
θ	4.686	0.6462	0.0209	3.506	4.658	6.105	11000	1000

Use of a non-informative prior for β

```
model{
for(i in 1:N){
zeros[i] <- 0
phi[i] <- - loglike[i]
zeros[i] ~ dpois(phi[i])
loglike[i]<- delta[i]*treatment[i]*beta + delta[i]*log(lambda[i])
              - exp(beta*treatment[i])*Lambda[i]
Lambda[i] <- lambda[i]*t[i]
lambda[i] ~ dgamma(1, tau.lambda)
}
beta <- log(theta)
theta ~ dgamma(0.01,0.01)
tau.lambda ~ dunif(0.00011,1000)
}
list(t=c(6,6,6,7,10,13,16,22,23,6,9,10,11,17,19,20,25,32,
         32,34,35,1,1,2,2,3,4,4,5,5,8,8,8,8,11,11,12,12,15,17,22,23)
         ,delta=c(1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1
         ,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1),
         treatment=c(1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,2,2,
         2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2),N = 42)
```

	mean	sd	MC error	val97.5pc	median	val2.5pc	start	sample
β	1.946	0.439	0.01646	1.012	1.98	2.691	11000	1000
$\lambda[1]$	0.007489	0.009033	3.171E-4	4.497E-4	0.004673	0.02973	11000	1000
$\lambda[2]$	0.007815	0.009918	3.646E-4	5.234E-4	0.004594	0.03677	11000	1000
$\lambda[3]$	0.007412	0.009382	3.414E-4	6.029E-4	0.004563	0.03345	11000	1000
$\lambda[4]$	0.007448	0.009272	3.974E-4	5.115E-4	0.004478	0.0341	11000	1000
$\lambda[5]$	0.006713	0.007873	2.659E-4	4.655E-4	0.004003	0.02789	11000	1000
$\lambda[6]$	0.006484	0.007883	2.851E-4	4.193E-4	0.004031	0.02793	11000	10000
$\lambda[7]$	0.005996	0.007239	2.736E-4	3.991-4	0.003666	0.02686	11000	1000
$\lambda[8]$	0.005438	0.007307	2.82E-4	4.259E-4	0.003445	0.02271	11000	1000
$\lambda[9]$	0.005154	0.005449	2.147E-4	4.28E-4	0.00344	0.02026	11000	1000
$\lambda[10]$	0.003738	0.006029	1.921E-4	4.323E-5	0.001794	0.01684	11000	1000
$\lambda[11]$	0.003293	0.004707	1.677E-4	6.363E-5	0.001732	0.01579	11000	1000
$\lambda[12]$	0.003256	0.00539	2.02E-4	5.203E-5	0.001685	0.0166	11000	1000
$\lambda[13]$	0.003351	0.005086	2.022E-4	4.472E-5	0.00166	0.01861	11000	1000
$\lambda[14]$	0.002964	0.004292	1.522E-4	5.849E-5	0.001539	0.0136	11000	1000
$\lambda[15]$	0.00282	0.003919	1.391E-4	4.73E-5	0.001491	0.01468	11000	1000
$\lambda[16]$	0.002902	0.004134	1.314E-4	5.116E-5	0.001523	0.0137	11000	1000
$\lambda[17]$	0.002519	0.003348	1.296E-4	3.773E-5	0.001454	0.01196	11000	1000
$\lambda[18]$	0.002191	0.002741	8.109E-5	4.127E-5	0.001323	0.009919	11000	1000
$\lambda[19]$	0.00222	0.003254	9.474E-5	5.016E-5	0.00122	0.01036	11000	1000
$\lambda[20]$	0.002223	0.002869	9.471E-5	2.896E-5	0.001268	0.01047	11000	1000
$\lambda[21]$	0.002061	0.002762	9.265E-5	4.321E-5	0.001169	0.009231	11000	1000
$\lambda[22]$	0.008171	0.01398	5.607E-4	6.069E-4	0.004684	0.03336	11000	1000
$\lambda[23]$	0.008036	0.01255	3.837E-4	4.476E-4	0.0045	0.03818	11000	1000
$\lambda[24]$	0.007099	0.01088	3.513E-4	3.176E-4	0.003868	0.03313	11000	1000
$\lambda[25]$	0.007219	0.01033	3.223E-4	4.612E-4	0.003968	0.03354	11000	1000
$\lambda[26]$	0.006251	0.009411	3.234E-4	3.386E-4	0.003424	0.03059	11000	1000
$\lambda[27]$	0.005519	0.009895	3.504E-4	2.81E-4	0.003125	0.0237	11000	1000
$\lambda[28]$	0.005669	0.008758	3.369E-4	2.936E-4	0.003083	0.02525	11000	1000
$\lambda[29]$	0.005229	0.007608	2.59E-4	3.379E-4	0.002874	0.02569	11000	1000
$\lambda[30]$	0.005132	0.007425	2.389E-4	3.242E-4	0.00276	0.02537	11000	1000
$\lambda[31]$	0.003956	0.005398	1.778E-4	2.406E-4	0.00276	0.01821	11000	1000
$\lambda[32]$	0.004055	0.006008	1.897E-4	2.131E-4	0.002085	0.01845	11000	1000
$\lambda[33]$	0.004096	0.005357	1.937E-4	2.259E-4	0.002193	0.01961	11000	1000
$\lambda[34]$	0.004302	0.007082	2.628E-4	1.958E-4	0.002312	0.02011	11000	1000
$\lambda[35]$	0.003463	0.005656	2.172E-4	1.972E-4	0.001886	0.0152	11000	1000
$\lambda[36]$	0.003433	0.005087	1.943E-4	2.179E-4	0.001863	0.01842	11000	1000
$\lambda[37]$	0.003204	0.004556	1.565E-4	1.736E-4	0.001761	0.01524	11000	1000
$\lambda[38]$	0.003317	0.004869	1.866E-4	1.748E-4	0.001707	0.01716	11000	1000
$\lambda[39]$	0.00289	0.004193	1.458E-4	1.582E-4	0.001538	0.01487	11000	1000
$\lambda[40]$	0.0026	0.004179	1.658E-4	1.376E-4	0.001433	0.0118	11000	1000
$\lambda[41]$	0.002051	0.003005	1.039E-4	1.236E-4	0.001105	0.009943	11000	1000
$\lambda[42]$	0.002151	0.003721	1.325E-4	1.305E-4	0.001101	0.01088	11000	1000
$\tau.\lambda$	372.2	237.9	8.509	62.17	315.7	935.2	11000	1000
θ	7.664	3.187	0.1136	2.751	7.241	14.75	11000	1000

Appendix OpenBugs code (example 2)

```
model {
for (i in 1:N) {
zeros[i] <- 0
phi[i] <- - loglike[i]
zeros[i] ~ dpois(phi[i])
loglike[i]<- delta[i]*size.tumor[i]*beta + delta[i]*log(lambda[i]) - exp(beta*size.tumor
Lambda[i] <- lambda[i]*t[i]
lambda[i]~ dgamma(1, tau.lambda)
}
beta <- log(theta)
theta ~ dgamma(3.26,10)
tau.lambda ~ dunif(0.00001,1000)
}
list(t=c(28,89,175,195,309,377,393,421,447,462,709,744,770
,1106,1206,34,88,137,199,280,291,299,300,309,351,358
,369,369,370,375,382,392,429,451,1119),
size.tumor=c(1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0),
              delta=c(1,1,1,1,1,0,0,0,0,1,0,0,0,0,0,1,1,1,1,1,1,0,0
                    ,1,1,1,1,1,1,1,1,1,1,0,1,0),N = 35)
```

	mean	sd	MC error	val97.5pc	median	val2.5pc	start	sample
β	-1.103	0.1701	0.00436	-1.452	-1.093	-0.7915	11000	1000
$\lambda[1]$	0.005431	0.004088	1.226E-4	6.286E-4	0.004259	0.0161	11000	1000
$\lambda[2]$	0.005133	0.003903	1.291E-4	5.289E-4	0.004087	0.0154	11000	1000
$\lambda[3]$	0.005016	0.003932	1.282E-4	4.58E-4	0.004049	0.01564	11000	1000
$\lambda[4]$	0.004881	0.003697	1.048E-4	6.142E-4	0.003655	0.01484	11000	1000
$\lambda[5]$	0.004257	0.003161	1.048E-4	5.062E-4	0.003481	0.01209	11000	1000
$\lambda[6]$	0.002128	0.002127	6.31E-5	5.451E-5	0.001493	0.008205	11000	1000
$\lambda[7]$	0.002037	0.002192	7.657E-5	3.55E-5	0.001229	0.00795	11000	1000
$\lambda[8]$	0.002089	0.002194	6.187E-5	3.146E-5	0.001416	0.008297	11000	1000
$\lambda[9]$	0.002029	0.002055	5.174E-4	6.505E-4	0.001362	0.007852	11000	1000
$\lambda[10]$	0.003783	0.002923	8.515E-5	3.981E-4	0.002994	0.0117	11000	1000
$\lambda[11]$	0.001648	0.001702	6.015E-5	2.81E-5	0.001204	0.00604	11000	1000
$\lambda[12]$	0.00158	0.001615	5.304E-5	5.036E-5	0.001057	0.005995	11000	1000
$\lambda[13]$	0.001575	0.00166	5.437E-5	3.368E-5	0.001066	0.006173	11000	1000
$\lambda[14]$	0.001372	0.001371	3.968E-5	2.853E-5	9.496E-4	0.005088	11000	1000
$\lambda[15]$	0.001289	0.001488	4.62E-5	2.959E-5	8.681E-4	0.004879	11000	1000
$\lambda[16]$	0.005084	0.004052	9.403E-5	6.113E-4	0.004126	0.01509	11000	1000
$\lambda[17]$	0.004423	0.003388	1.107E-4	5.203E-4	0.00358	0.01311	11000	1000
$\lambda[18]$	0.004114	0.003136	7.561E-5	4.254E-4	0.003421	0.01192	11000	1000
$\lambda[19]$	0.00366	0.002742	9.735E-5	4.045E-4	0.003009	0.01101	11000	1000
$\lambda[20]$	0.003071	0.00231	5.244E-5	3.265E-4	0.002436	0.009188	11000	1000
$\lambda[21]$	0.003088	0.00229	6.913E-5	3.472E-4	0.002512	0.009033	11000	1000
$\lambda[22]$	0.001447	0.00154	4.934E-5	3.946E-5	9.433E-4	0.005445	11000	1000
$\lambda[23]$	0.001549	0.001566	5.892E-5	4.49E-5	0.001055	0..5191	11000	1000
$\lambda[24]$	0.002929	0.002045	7.899E-5	3.701E-4	0.002453	0.008261	11000	1000
$\lambda[25]$	0.002734	0.002036	8.597E-5	3.995E-4	0.002233	0.008102	11000	1000
$\lambda[26]$	0.002793	0.002183	7.657E-5	2.843E-4	0.002245	0.008362	11000	1000
$\lambda[27]$	0.00271	0.001905	5.015E-5	2.99E-4	0.002249	0.007581	11000	1000
$\lambda[28]$	0.002728	0.001956	8.009E-5	3.094E-4	0.002219	0.007421	11000	1000
$\lambda[29]$	0.002808	0.001974	6.402E-5	2.948E-4	0.002363	0.008087	11000	1000
$\lambda[30]$	0.002782	0.002017	6.336E-5	3.479E-4	0.00236	0.00789	11000	1000
$\lambda[31]$	0.002649	0.001935	5.244E-5	2.637E-4	0.002135	0.007948	11000	1000
$\lambda[32]$	0.00266	0.001901	5.573E-5	3.137E-4	0.00219	0.007696	11000	1000
$\lambda[33]$	0.001284	0.001239	4.13E-5	4.566E-5	9.031E-4	0.004794	11000	1000
$\lambda[34]$	0.002351	0.00173	4.302E-5	2.997E-4	0.001912	0.006847	11000	1000
$\lambda[35]$	6.59E-4	6.633E-4	1.915E-5	1.526E-5	4.358E-4	0.002556	11000	1000
$\tau.\lambda$	384.3	119.6	4.211	204.3	369.1	663.6	11000	1000
θ	0.3368	0.05636	0.001413	0.234	0.3353	0.4532	11000	1000

Appendix OpenBugs code (example 3)

```
model {
for (i in 1:N) {
zeros[i] <- 0
phi[i] <- - loglike[i]
zeros[i] ~ dpois(phi[i])
loglike[i] <- delta[i]*( beta1*stage.II[i] + beta2*stage.III[i] +
                         beta3*stage.IV[i] + beta4*age[i] +
                         beta5*(stage.II[i]*age[i]) +
                         beta6*(stage.III[i]*age[i]) + beta7*(stage.IV[i]*age[i])) +
                         delta[i]*log(lambda[i]) - exp(beta1*stage.II[i] +
                         beta2*stage.III[i] + beta3*stage.IV[i] +
                         beta4*age[i] +  beta5*(stage.II[i]*age[i]) +
                         beta6*(stage.III[i]*age[i]) +
                         beta7*(stage.IV[i]*age[i]))*Lambda[i]
Lambda[i] <- lambda[i]*t[i]
lambda[i] ~ dgamma(1, tau.lambda)
}
tau.lambda ~ dunif(0.00001,1000)
beta1 <- log(theta1)
theta1 ~ dgamma(354,1000000)
beta2 <- log(theta2)
theta2 ~ dgamma(885,1000)
beta3 <- log(theta3)
theta3 ~ dgamma(2332,1000)
beta4 <- log(theta4)
theta4 ~ dgamma(997,1000)
beta5 <- log(theta5)
theta5 ~ dgamma(1128,1000)
beta6 <- log(theta6)
theta6 ~ dgamma(1011,1000)
beta7 <- log(theta7)
theta7 ~ dgamma(1014,1000)

}
list(t=c(0.6,1.3,2.4,2.5,3.2,3.2,3.3,3.3,3.5,3.5,4.0,4.0,4.3,4.5,4.5,5.3,5.5,
         5.9,5.9,6.0,6.1,6.2,6.4,6.5,6.5,6.7,7.0,7.4,7.4,8.1,8.1,9.6,10.7,0.2,
         1.8,2.0,2.2,2.6,3.3,3.6,3.6,4.0,4.3,4.3,5.0,6.2,7.0,7.5,7.6,9.3,0.3,0.3,
         0.5,0.7,0.8,1.0,1.3,1.6,1.8,1.9,1.9,3.2,3.5,3.7,4.5,4.8,4.8,5.0,5.0,
         5.1,6.3,6.4,6.5,7.8,8.0,9.3,10.1,0.1,0.3,0.4,0.8,0.8,1.0,1.5,2.0,2.3,
         2.9,3.6,3.8,4.3),
         age=c(77,53,45,57,58,51,76,63,43,60,52,63,86,48,68,81,70,58,47,75,77,64,
         77,67,79,61,66,68,73,56,73,58,68,86,64,63,71,67,51,70,72,81,47,64,66,74,
         62,50,53,61,49,71,57,79,82,49,60,64,74,72,53,54,81,52,66,54,63,59,49,69,
```

```
112         70,65,65,68,78,69,51,65,71,76,65,78,41,68,69,62,74,71,84,48),
113         delta=c(1,1,1,0,1,0,1,0,1,1,1,1,1,0,0,1,0,0,0,1,0,0,1,1,0,0,0,1,0,0,0,0,
114         0,1,1,1,0,0,0,1,0,1,0,0,0,1,1,0,0,0,1,1,1,1,1,1,1,1,1,1,1,1,0,0,0,0,1,
115         0,0,1,1,0,1,0,0,0,1,1,1,1,1,1,1,1,1,0,1,1,0),
116         stage.II=c(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
117         0,0,0,0,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,
118         0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0),
119         stage.III=c(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
120         0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,
121         1,1,1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0),
122         stage.IV=c(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
123         0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
124         0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,1,1,1,1,1,1,1,1), N = 90)
```

	mean	sd	MC error	val2.5pc	median	val97.5pc	start	sample
β_1	-7.946	0.05189	0.002268	-8.036	-7.949	-7.84	110000	1000
β_2	-0.1209	0.03401	0.001321	-0.1871	-0.1215	-0.05248	11000	1000
β_3	0.8459	0.02126	7.687E-4	0.8028	0.846	0.8864	11000	1000
β_4	0.01339	0.01567	0.002597	-0.01774	0.01203	0.04004	11000	1000
β_5	0.1175	0.008543	0.001211	0.09861	0.1186	0.1313	11000	1000
β_6	0.01589	0.006852	3.897E-4	0.002389	0.01615	0.03023	11000	1000
β_7	0.01615	0.008257	4.686E-4	-7.94E-5	0.01631	0.03316	11000	1000
$\lambda[1]$	0.1237	0.1947	0.02197	0.004379	0.05535	0.7042	11000	1000
$\lambda[2]$	0.1219	0.2037	0.02263	0.004652	0.05618	0.6606	11000	1000
$\lambda[3]$	0.1036	0.1509	0.01677	0.004583	0.05372	0.5152	11000	1000
$\lambda[4]$	0.05696	0.1024	0.01007	6.103E-4	0.02184	0.3362	11000	1000
$\lambda[5]$	0.1007	0.1529	0.01852	0.00331	0.0447	0.594	11000	1000
$\lambda[6]$	0.04694	0.07689	0.007404	5.15E-4	0.0197	0.2457	11000	1000
$\lambda[7]$	0.1063	0.1758	0.02004	0.003182	0.04812	0.6048	11000	1000
$\lambda[8]$	0.05294	0.1093	0.01029	4.466E-4	0.01802	0.3071	11000	1000
$\lambda[9]$	0.09644	0.1316	0.01548	0.004689	0.05027	0.4753	11000	1000
$\lambda[10]$	0.1025	0.1614	0.01769	0.002893	0.04704	0.5455	11000	1000
$\lambda[11]$	0.09581	0.1356	0.01584	0.003635	0.04885	0.4753	11000	1000
$\lambda[12]$	0.09562	0.1338	0.01551	0.003871	0.04956	0.5133	11000	1000
$\lambda[13]$	0.09019	0.1524	0.01716	0.002742	0.03865	0.5215	11000	1000
$\lambda[14]$	0.04788	0.08175	0.008805	6.899E-4	0.01944	0.2714	11000	1000
$\lambda[15]$	0.05001	0.09046	0.009536	4.825E-4	0.01907	0.3229	11000	1000

$\lambda[16]$	0.09036	0.1438	0.01765	0.002452	0.03852	0.5639	11000	1000
$\lambda[17]$	0.04166	0.07379	0.00741	4.741E-4	0.01531	0.2433	11000	1000
$\lambda[18]$	0.04127	0.06893	0.006752	4.367E-4	0.01674	0.2284	11000	1000
$\lambda[19]$	0.04272	0.07367	0.006821	3.316E-4	0.01759	0.2419	11000	1000
$\lambda[20]$	0.0832	0.1401	0.01577	0.002838	0.03465	0.4375	11000	1000
$\lambda[21]$	0.04281	0.08196	0.007634	3.51E-4	0.01654	0.2536	11000	1000
$\lambda[22]$	0.04281	0.08234	0.007405	4.966E-4	0.01643	0.02464	11000	1000
$\lambda[23]$	0.08317	0.1341	0.01624	0.002565	0.03289	0.4494	11000	1000
$\lambda[24]$	0.08157	0.1218	0.01478	0.00264	0.03779	0.4674	11000	1000
$\lambda[25]$	0.04455	0.09145	0.00923	3.341E-4	0.01434	0.2579	11000	1000
$\lambda[26]$	0.03976	0.07524	0.007381	3.889E-4	0.01528	0.2673	11000	1000
$\lambda[27]$	0.3829	0.06949	0.005697	4.966E-4	0.01516	0.2738	11000	1000
$\lambda[28]$	0.08094	0.1342	0.01492	0.002201	0.03634	0.4456	11000	1000
$\lambda[29]$	0.04134	0.09094	0.008242	3.761E-4	0.01449	0.2753	11000	1000
$\lambda[30]$	0.03873	0.07199	0.007167	3.707E-4	0.01425	0.222	11000	1000
$\lambda[31]$	0.0368	0.07176	0.006951	4.477E-4	0.01386	0.2354	11000	1000
$\lambda[32]$	0.03486	0.06511	0.005659	3.247E-4	0.01362	0.1974	11000	1000
$\lambda[33]$	0.03425	0.07192	0.006805	2.944E-4	0.01203	0.2038	11000	1000
$\lambda[34]$	0.1047	0.1617	0.01747	0.002855	0.04924	0.5463	11000	1000
$\lambda[35]$	0.1086	0.1473	0.01817	0.003991	0.05967	0.5848	11000	1000
$\lambda[36]$	0.127	0.2149	0.02422	0.003535	0.05936	0.7737	11000	1000
$\lambda[37]$	0.05352	0.1101	0.009723	4.709E-4	0.01849	0.3187	11000	1000
$\lambda[38]$	0.05437	0.09991	0.009331	4.843E-4	0.02028	0.3491	11000	1000
$\lambda[39]$	0.06346	0.1217	0.01156	6.273E-4	0.02349	0.3883	11000	1000
$\lambda[40]$	0.08917	0.1315	0.01534	0.002874	0.04268	0.452	11000	100
$\lambda[41]$	0.03909	0.06639	0.00645	3.387E-4	0.01575	0.2308	11000	1000
$\lambda[42]$	0.0497	0.08875	0.01012	8.992E-4	0.02005	0.2897	11000	1000
$\lambda[43]$	0.06462	0.1215	0.01091	8.386E-4	0.02506	0.3664	11000	1000
$\lambda[44]$	0.05155	0.09286	0.008611	4.809E-4	0.02144	0.2999	11000	1000
$\lambda[45]$	0.04383	0.07542	0.007217	4.361E-4	0.01956	0.2471	11000	1000
$\lambda[46]$	0.05508	0.08042	0.009088	0.001544	0.02821	0.2883	11000	1000
$\lambda[47]$	0.09278	0.1362	0.01633	0.003283	0.04527	0.4587	11000	1000
$\lambda[48]$	0.06736	0.1383	0.01289	5.565E-4	0.02418	0.4317	11000	1000
$\lambda[49]$	0.0593	0.1051	0.01018	5.752E-4	0.02265	0.3412	11000	1000
$\lambda[50]$	0.04237	0.07271	0.00702	3.565E-4	0.0161	0.2852	11000	100

$\lambda[51]$	0.1275	0.1888	0.02206	0.004825	0.05856	0.6512	11000	1000
$\lambda[52]$	0.1297	0.2138	0.02417	0.004459	0.05734	0.7685	11000	1000
$\lambda[53]$	0.1197	0.1819	0.02028	0.004019	0.05401	0.6585	11000	100
$\lambda[54]$	0.1094	0.1726	0.01931	0.003362	0.05298	0.06459	11000	1000
$\lambda[55]$	0.1079	0.1881	0.02147	0.002788	0.04792	0.5418	11000	1000
$\lambda[56]$	0.108	0.1546	0.01842	0.003456	0.053	0.599	11000	1000
$\lambda[57]$	0.1051	0.1847	0.01788	0.004197	0.0493	0.5083	11000	1000
$\lambda[58]$	0.09735	0.1504	0.01719	0.00308	0.04684	0.4691	11000	1000
$\lambda[59]$	0.0946	0.1682	0.01965	0.002727	0.03842	0.5193	11000	1000
$\lambda[60]$	0.09157	0.1566	0.01731	0.002565	0.04008	0.5781	11000	1000
$\lambda[61]$	0.09532	0.1407	0.01577	0.003642	0.04683	0.4928	11000	1000
$\lambda[62]$	0.08395	0.1268	0.01412	0.003509	0.04156	0.4365	11000	1000
$\lambda[63]$	0.06432	0.1126	0.01247	0.00195	0.02544	0.3638	11000	1000
$\lambda[64]$	0.0396	0.06912	0.006272	4.022E-4	0.01644	0.2224	11000	1000
$\lambda[65]$	0.03278	0.0692	0.006118	1.982E-4	0.01107	0.1967	11000	1000
$\lambda[66]$	0.03273	0.05872	0.005475	3.421E-4	0.01338	0.1966	11000	1000
$\lambda[67]$	0.03248	0.06222	0.006252	3.698E-4	0.01126	0.1929	11000	1000
$\lambda[68]$	0.06356	0.08647	0.009867	0.002601	0.03097	0.3508	11000	1000
$\lambda[69]$	0.03277	0.05576	0.005158	4.333E-4	0.01372	0.1886	11000	1000
$\lambda[70]$	0.03175	0.06132	0.005975	3.58E-4	0.01036	0.2168	11000	1000
$\lambda[71]$	0.05427	0.08477	0.009907	0.001668	0.02403	0.3176	11000	1000
$\lambda[72]$	0.05238	0.08091	0.009245	0.001618	0.02531	0.2998	11000	1000
$\lambda[73]$	0.02483	0.04895	0.004586	2.391E-4	0.009436	0.1348	11000	1000
$\lambda[74]$	0.04842	0.07939	0.009458	0.001449	0.01947	0.2896	11000	1000
$\lambda[75]$	0.02235	0.05143	0.004397	1.766E-4	0.005965	0.1636	11000	1000
$\lambda[76]$	0.02238	0.05335	0.004907	1.859E-4	0.00685	0.1517	11000	1000
$\lambda[77]$	0.02244	0.03559	0.003383	2.826E-4	0.00988	0.1212	11000	1000
$\lambda[78]$	0.123	0.1834	0.02126	0.003881	0.05647	0.7529	11000	1000
$\lambda[79]$	0.1068	0.1576	0.01782	0.003352	0.05271	0.5908	11000	1000
$\lambda[80]$	0.1015	0.1714	0.01903	0.002515	0.0445	0.614	11000	1000
$\lambda[81]$	0.08542	0.136	0.0145	0.003022	0.03882	0.4533	11000	1000
$\lambda[82]$	0.08542	0.1451	0.01636	0.001981	0.03544	0.4763	11000	1000
$\lambda[83]$	0.09541	0.1516	0.01565	0.003651	0.05035	0.4897	11000	1000
$\lambda[84]$	0.06488	0.09793	0.01102	0.001907	0.03074	0.3501	11000	1000
$\lambda[85]$	0.05359	0.08637	0.009576	0.001673	0.02365	0.2867	11000	1000

$\lambda[86]$	0.05564	0.0859	0.00944	0.001961	0.02508	0.3215	11000	1000
$\lambda[87]$	0.01913	0.03655	0.003368	1.718E-4	0.006599	0.1199	11000	1000
$\lambda[88]$	0.03789	0.06686	0.007264	0.001108	0.01543	0.2075	11000	1000
$\lambda[89]$	0.03242	0.0702	0.006622	5.46E-4	0.01123	0.2043	11000	1000
$\lambda[90]$	0.02098	0.03674	0.002916	3.09E-4	0.009682	0.1043	11000	1000
$\tau.\lambda$	40.96	43.93	6.616	3.166	23.88	163.7	11000	1000
θ_1	3.546E-4	1.849E-5	8.022E-7	3.236E-4	3.53E-4	3.938E-4	11000	1000
θ_2	0.8866	0.03015	0.001163	0.8293	0.8856	0.9489	11000	1000
θ_3	2.331	0.04951	0.001792	2.232	2.33	2.426	11000	1000
θ_4	1.014	0.01586	0.002627	0.9824	1.012	1.041	11000	1000
θ_5	1.125	0.009589	0.001358	1.104	1.126	1.14	11000	1000
θ_6	1.016	0.006961	3.96E-4	1.002	1.016	1.031	11000	1000
θ_7	1.016	0.008391	4.759E-4	0.9999	1.016	1.034	11000	1000