



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
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Appendix A

Geometric mean of Von Mises stress on cortical and cancellous bone (bilateral)

Geometric mean of Von Mises stress on cortical bone layer.										
Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum		
					Lower Bound	Upper Bound				
1	30000	0.1642	0.08800	0.00051	0.1632	0.1652	0.03	0.93		
2	30000	0.2964	0.21495	0.00124	0.2939	0.2988	0.04	3.11		
3	30000	0.4883	0.38477	0.00222	0.4839	0.4926	0.03	4.86		
4	30000	0.1484	0.07045	0.00041	0.1476	0.1492	0.03	0.81		
5	30000	0.2315	0.14464	0.00084	0.2298	0.2331	0.03	1.87		
6	30000	0.3322	0.25201	0.00145	0.3293	0.3350	0.02	3.57		
7	30000	0.1740	0.08549	0.00049	0.1730	0.1750	0.02	1.14		
8	30000	0.2354	0.12377	0.00071	0.2340	0.2368	0.04	1.26		
9	30000	0.1613	0.07684	0.00044	0.1604	0.1621	0.02	0.97		
10	30000	0.2061	0.12242	0.00071	0.2047	0.2075	0.02	1.48		
ANOVA										
		Sum of Squares		df	Mean Square	F	Sig.			
	Between Groups	2973.198		9	330.355	9864.043	0.000			
	Within Groups	10046.924		299990	0.033					
	Total	13020.123		299999						

Geometric mean of Von Mises stress on cancellous bone layer									
Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
1	100000	0.0192	0.00658	0.00002	0.0191	0.0192	0.00	0.07	
2	100000	0.0440	0.01862	0.00006	0.0439	0.0442	0.00	0.20	
3	100000	0.0969	0.04516	0.00014	0.0966	0.0972	0.01	0.39	
4	100000	0.0174	0.00586	0.00002	0.0174	0.0174	0.00	0.09	
5	100000	0.0305	0.01069	0.00003	0.0305	0.0306	0.00	0.13	
6	100000	0.0586	0.02404	0.00008	0.0585	0.0588	0.00	0.29	
7	100000	0.0350	0.01252	0.00004	0.0350	0.0351	0.00	0.14	
8	100000	0.0400	0.01682	0.00005	0.0399	0.0401	0.00	0.18	
9	100000	0.0244	0.00791	0.00003	0.0244	0.0245	0.00	0.11	
10	100000	0.0311	0.01246	0.00004	0.0310	0.0312	0.00	0.13	
Total	1000000	0.0397	0.02965	0.00003	0.0397	0.0398	0.00	0.039	
ANOVA									
		Sum of Squares	df	Mean Square	F	Sig.			
Between Groups		497.860	9	55.318	145065.701	0.000			
Within Groups		381.326	999990	0.000					
Total		879.186	999999						

Geometric mean of maximum principal strain on cortical and cancellous bone.

Geometric mean of maximum principal strain on cancellous bone layer										
Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum		
					Lower Bound	Upper Bound				
1	100000	0.00000699	0.00000292	0.00000	0.00000	0.00000	0.000000	0.000043		
2	100000	0.00002067	0.00001022	0.00000	0.00000	0.00000	0.000000	0.000135		
3	100000	0.00004566	0.00002411	0.00000	0.00000	0.00000	0.000000	0.000209		
4	100000	0.00000599	0.00000255	0.00000	0.00000	0.00000	0.000000	0.000040		
5	100000	0.00001776	0.00000715	0.00000	0.00000	0.00000	0.000000	0.000090		
6	100000	0.00002626	0.00001211	0.00000	0.00000	0.00000	0.000000	0.000133		
7	100000	0.00001519	0.00000610	0.00000	0.00000	0.00000	0.000000	0.000072		
8	100000	0.00001587	0.00000787	0.00000	0.00000	0.00000	0.000000	0.000102		
9	100000	0.00001027	0.00000426	0.00000	0.00000	0.00000	0.000000	0.000057		
10	100000	0.00001165	0.00000585	0.00000	0.00000	0.00000	0.000000	0.000068		
Total	1000000	0.00001763	0.00001506	0.00000	0.00000	0.00000	0.000000	0.000209		
ANOVA										
	Sum of Squares	df	Mean Square	F	Sig.					
Between Groups	0.000	9	0.000	128829.008	0.000					
Within Groups	0.000	999990	0.000							
Total	0.000	999999								

Geometric mean of maximum principal strain on cortical bone layer										
Group	N	Mean	Std Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum		
					Lower Bound	Upper Bound				
1	30000	0.00000697	0.00000471	0.00000	0.0000	0.0000	0.000000	0.000051		
2	30000	0.00001101	0.00000629	0.00000	0.0000	0.0000	0.000000	0.000118		
3	30000	0.00001762	0.00001183	0.00000	0.0000	0.0000	0.000000	0.000169		
4	30000	0.00000623	0.00000385	0.00000	0.0000	0.0000	0.000000	0.000042		
5	30000	0.00000943	0.00000572	0.00000	0.0000	0.0000	0.000000	0.000073		
6	30000	0.00001306	0.00000914	0.00000	0.0000	0.0000	0.000000	0.000126		
7	30000	0.00000721	0.00000424	0.00000	0.0000	0.0000	0.000000	0.000048		
8	30000	0.00000981	0.00000657	0.00000	0.0000	0.0000	0.000000	0.000073		
9	30000	0.00000672	0.00000394	0.00000	0.0000	0.0000	0.000000	0.000046		
10	30000	0.00000838	0.00000543	0.00000	0.0000	0.0000	0.000000	0.000066		
Total	300000	0.00000964	0.00000742	0.00000	0.0000	0.0000	0.000000	0.000169		
ANOVA										
		Sum of Squares	df	Mean Square	F	Sig.				
Between Groups		0.000	9	0.000	8506.279	0.000				
Within Groups		0.000	299990	0.000						
Total		0.000	299999							

Appendix B

Geometric mean of Von Mises stress on cortical and cancellous bone. (Unilateral)

Geometric mean of Von Mises stress on cortical bone layer									
Group	N	Mean	Std Deviation	Std Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
1	30000	0.4791	0.32732	0.00189	0.4754	0.4828	0.03	3.49	
2	30000	0.6478	0.47894	0.00277	0.6424	0.6532	0.05	5.46	
3	30000	0.7331	0.53279	0.00308	0.7271	0.7391	0.07	6.09	
4	30000	0.5093	0.29590	0.00171	0.5060	0.5127	0.03	2.95	
5	30000	0.6054	0.42615	0.00246	0.6006	0.6103	0.04	4.96	
6	30000	0.7476	0.53383	0.00308	0.7416	0.7537	0.07	7.79	
7	30000	0.5175	0.31597	0.00182	0.5139	0.5211	0.04	3.62	
8	30000	0.5807	0.40421	0.00233	0.5761	0.5853	0.04	4.24	
9	30000	0.4875	0.22713	0.00131	0.4849	0.4901	0.06	2.39	
10.	30000	0.5690	0.36110	0.00208	0.5649	0.5731	0.04	4.10	
Total	300000	0.5877	0.41275	0.00075	0.5862	0.5892	0.03	7.79	
ANOVA									
		Sum of Squares	df	Mean Square	F	Sig.			
Between Groups		2519.230	9	279.914	1728.148	0.000			
Within Groups		48590.473	299990	0.162					
Total		51109.703	299999						

Geometric mean of Von Mises stress on cancellous bone layer.										
Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum		
					Lower Bound	Upper Bound				
1	100000	0.0895	0.02973	0.00009	0.0893	0.0896	0.00	0.31		
2	100000	0.0914	0.03948	0.00012	0.0911	0.0916	0.01	0.40		
3	100000	0.1102	0.04642	0.00015	0.1100	0.1105	0.01	0.45		
4	100000	0.0968	0.03181	0.00010	0.0966	0.0970	0.00	0.39		
5	100000	0.0714	0.02891	0.00009	0.0712	0.0716	0.00	0.25		
6	100000	0.1178	0.04530	0.00014	0.1175	0.1181	0.01	0.45		
7	100000	0.0919	0.03276	0.00010	0.0917	0.0921	0.00	0.34		
8	100000	0.0999	0.03723	0.00012	0.0997	0.1002	0.00	0.40		
9	100000	0.0949	0.03349	0.00011	0.0947	0.0952	0.00	0.37		
10	100000	0.1025	0.03747	0.00012	0.1023	0.1027	0.00	0.40		
Total	1000000	0.0966	0.03860	0.00004	0.0966	0.0967	0.00	0.45		

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	142.115	9	15.791	11712.317	0.000
Within Groups	1348.184	999990	0.001		
Total	1490.299	999999			

Geometric mean of maximum principal strain on cortical and cancellous bone

Geometric mean of maximum principal strain on cancellous bone layer										
Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum		
					Lower Bound	Upper Bound				
1	100000	0.00004570	.00001798	0.00000	0.0000	0.0000	0.000000	0.000197		
2	100000	0.00004697	.00002295	0.00000	0.0000	0.0000	0.000000	0.000244		
3	100000	0.00005170	.00002751	0.00000	0.0001	0.0001	0.000000	0.000268		
4	100000	0.00004922	.00001920	0.00000	0.0000	0.0000	0.000001	0.000225		
5	100000	0.00004900	.00002310	0.00000	0.0000	0.0000	0.000000	0.000269		
6	100000	0.00005689	.00002653	0.00000	0.0001	0.0001	0.000000	0.000292		
7	100000	0.00004676	.00002044	0.00000	0.0000	0.0000	0.000001	0.000255		
8	100000	0.00004884	.00002240	0.00000	0.0000	0.0000	0.000000	0.000287		
9	100000	0.00004890	.00002075	0.00000	0.0000	0.0000	0.000001	0.000267		
10	100000	0.00005054	.00002265	0.00000	0.0001	0.0001	0.000000	0.000284		
Total	1000000	0.00004945	.00002273	0.00000	0.0000	0.0000	0.000000	0.000292		
ANOVA										
		Sum of Squares	df	Mean Square	F	Sig.				
Between Groups		0.000	9	0.000	1970.579	0.000				
Within Groups		0.001	999990	0.000						
Total		0.001	999999							

Geometric mean of maximum principal strain on cortical bone layer									
Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
1	30000	0.00002294	0.00001948	0.00000	0.0000	0.0000	0.000000	0.000246	
2	30000	0.00002801	0.00002200	0.00000	0.0000	0.0000	0.000000	0.000245	
3	30000	0.00003053	0.00002331	0.00000	0.0000	0.0000	0.000000	0.000313	
4	30000	0.00002489	0.00001780	0.00000	0.0000	0.0000	0.000000	0.000210	
5	30000	0.00002753	0.00002153	0.00000	0.0000	0.0000	0.000000	0.000267	
6	30000	0.00003336	0.00002612	0.00000	0.0000	0.0000	0.000000	0.000400	
7	30000	0.00002421	0.00001731	0.00000	0.0000	0.0000	0.000000	0.000211	
8	30000	0.00002625	0.00002203	0.00000	0.0000	0.0000	0.000000	0.000320	
9	30000	0.00002426	0.00001624	0.00000	0.0000	0.0000	0.000000	0.000198	
10	30000	0.00002644	0.00001941	0.00000	0.0000	0.0000	0.000001	0.000235	
Total	300000	0.00002684	0.00002094	0.00000	0.0000	0.0000	0.000000	0.000400	
ANOVA									
	Sum of Squares	df	Mean Square	F	Sig.				
Between Groups	.000	9	0.000	707.230	0.000				
Within Groups	.000	299990	0.000						
Total	.000	299999							

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