Supplemental Document

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Speckle statistics of biological tissues in optical coherence tomography: supplement

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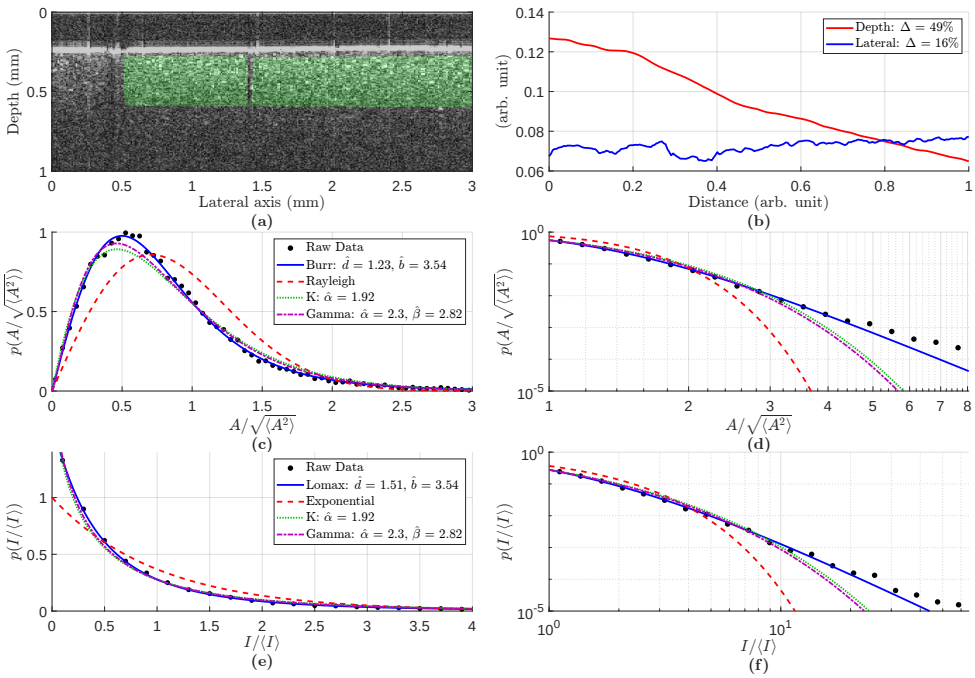

Fig. S1. 5% gelatin phantom without milk scanned with 500 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S1. Parameters and statistics for the 5% gelatin phantom without milk.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.23	0.964			38823	
	$\hat{b}$	3.54					
Rayleigh			0	-3806	<1e-6	46432	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	1.92	0.449	-396	<1e-6	39614	
Gamma	$\hat{\alpha}$	2.30	0.762	-337	<1e-6	39499	
	$\hat{\beta}$	2.82					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	1.51	0.909			19255	
	$\hat{b}$	3.54					
Rayleigh			0	-22768	<1e-6	64787	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	1.92	0.428	-3143	<1e-6	25540	
Gamma	$\hat{\alpha}$	2.30	0.720	-3511	<1e-6	26278	
	$\hat{\beta}$	2.82					

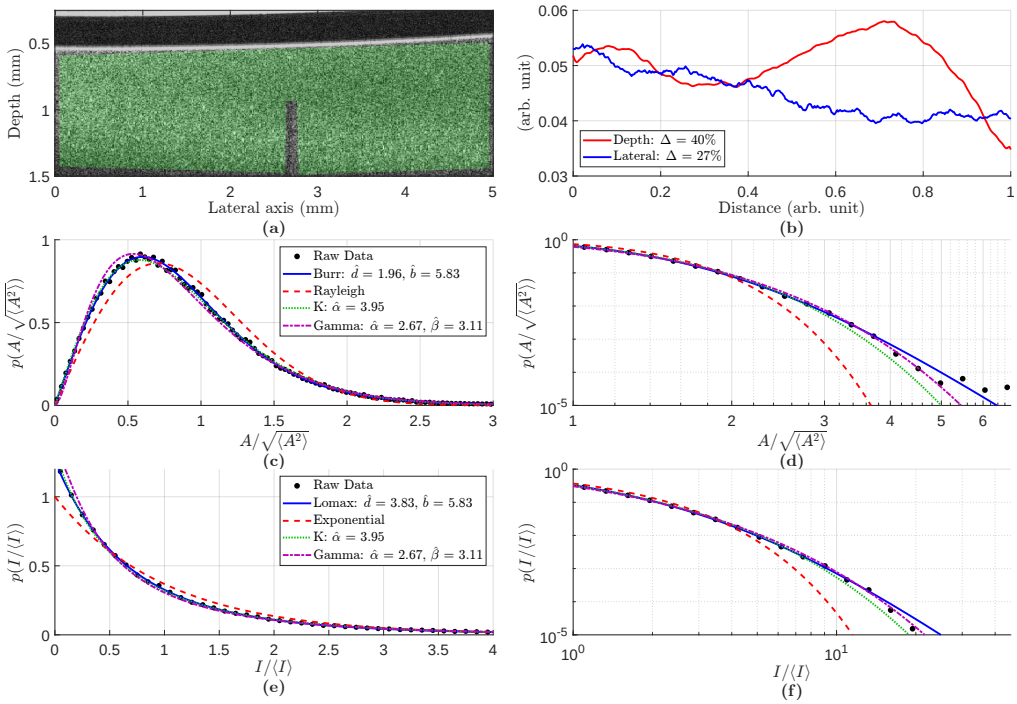

Fig. S2. 5% gelatin phantom with milk scanned with 500 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S2. Parameters and statistics for the 5% gelatin phantom with milk.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.96	0.958			222575	
	$\hat{b}$	5.83					
Rayleigh			0.033	-4287	<1e-6	231145	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	3.95	0.924	-138	<1e-6	222850	
Gamma	$\hat{\alpha}$	2.67	0.841	-476	<1e-6	223528	
	$\hat{\beta}$	3.11					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	3.83	0.869			20250	
	$\hat{b}$	5.83					
Rayleigh			0.002	-12798	<1e-6	45842	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	3.95	0.738	-2164	<1e-6	24577	
Gamma	$\hat{\alpha}$	2.67	0.095	-1052	<1e-6	22355	
	$\hat{\beta}$	3.11					

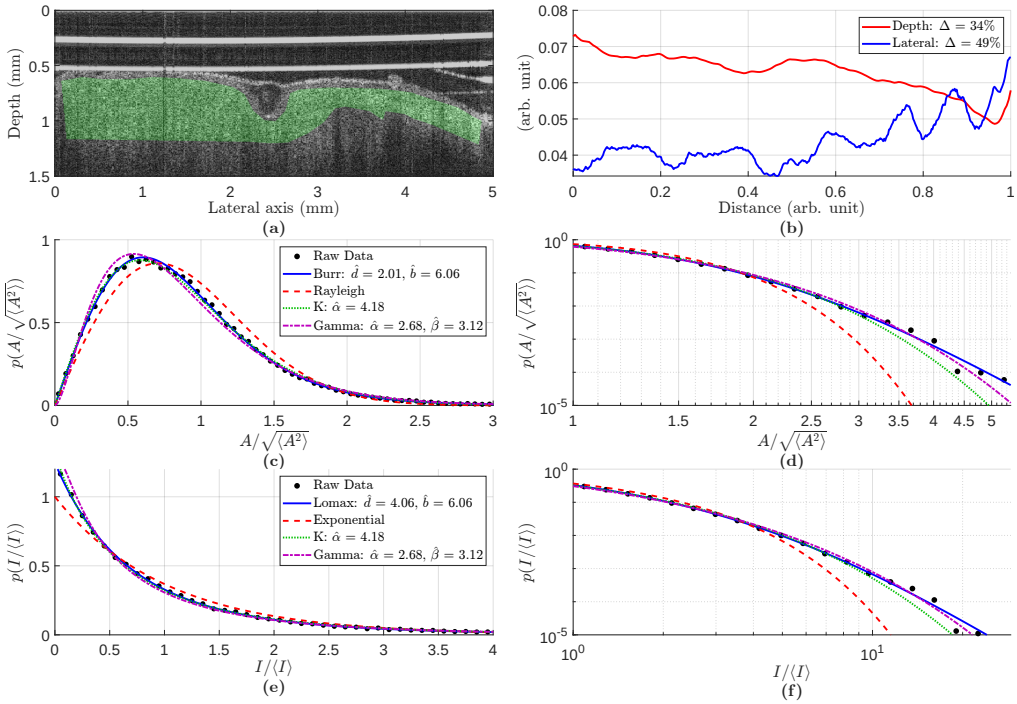

Fig. S3. Mouse brain with cranial window scanned with 500 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S3. Parameters and statistics for the mouse brain with cranial window.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	2.01	0.949			91077	
	$\hat{b}$	6.06					
Rayleigh			0.075	-1622	<1e-6	94317	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	4.18	0.929	-67	<1e-6	91210	
Gamma	$\hat{\alpha}$	2.68	0.816	-268	<1e-6	91614	
	$\hat{\beta}$	3.12					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	4.06	0.851			16400	
	$\hat{b}$	6.06					
Rayleigh			0.036	-6280	<1e-6	28956	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	4.18	0.828	-995	<1e-6	18389	
Gamma	$\hat{\alpha}$	2.68	0.662	-253	<1e-6	16906	
	$\hat{\beta}$	3.12					

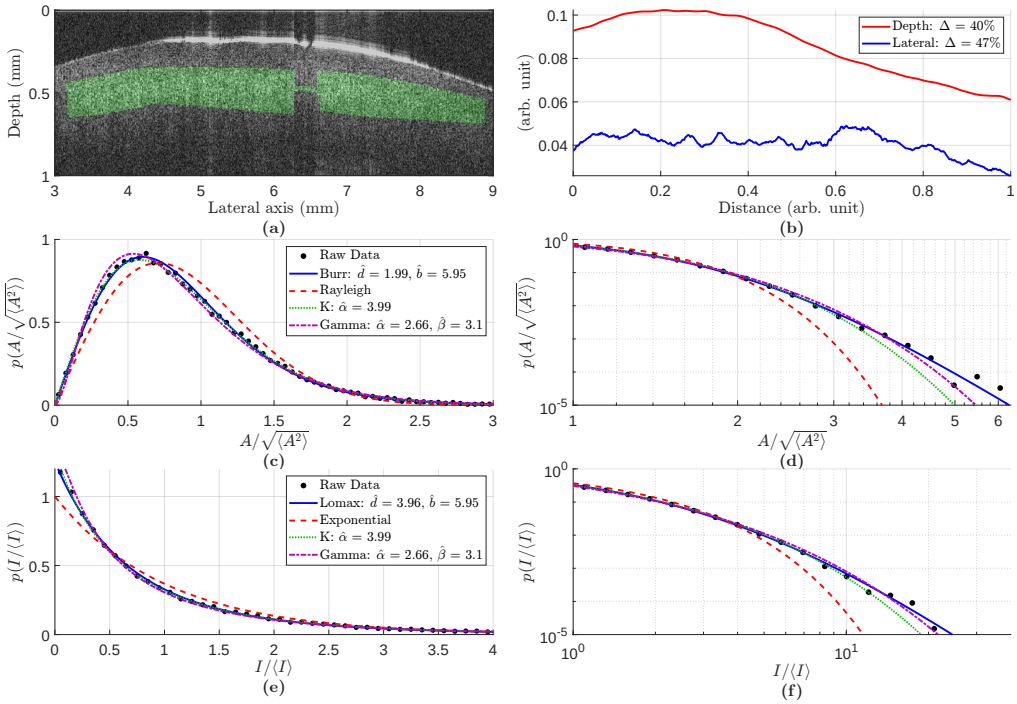

Fig. S4. Excised mouse liver in phosphate-buffered saline scanned with 1000 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S4. Parameters and statistics for the mouse liver.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.99	0.957			65863	
	$\hat{b}$	5.95					
Rayleigh			0.043	-1181	<1e-6	68220	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	3.99	0.935	-19	0.091	65898	
Gamma	$\hat{\alpha}$	2.66	0.879	-134	<1e-6	66131	
	$\hat{\beta}$	3.10					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	3.96	0.841			19147	
	$\hat{b}$	5.95					
Rayleigh			0.004	-10424	<1e-6	39990	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	3.99	0.771	-1703	<1e-6	22551	
Gamma	$\hat{\alpha}$	2.66	0.223	-4703	<1e-6	24554	
	$\hat{\beta}$	3.10					

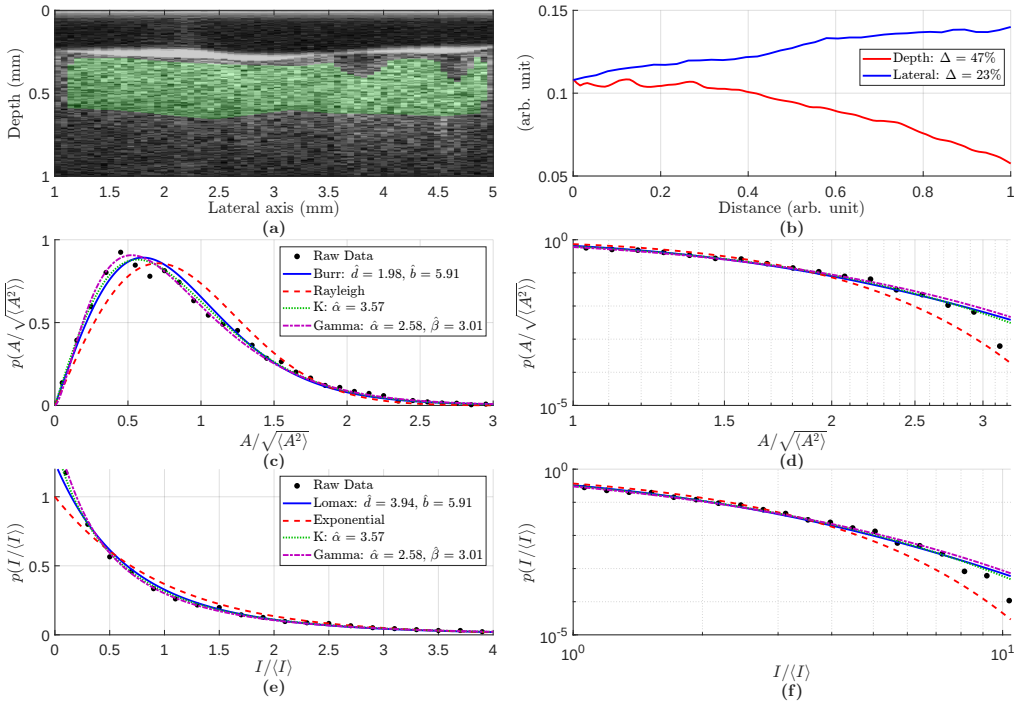

Fig. S5. Excised pig brain (cortex) scanned with 100 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S5. Parameters and statistics for the pig brain.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.98	0.892			9696	
	$\hat{b}$	5.91					
Rayleigh			0.013	-125	<1e-6	9941	KS, LRT, and AIC indicate K is the best model.
K	$\hat{\alpha}$	3.57	0.943	30	<1e-6	9635	
Gamma	$\hat{\alpha}$	2.58	0.913	10	0.15	9676	
	$\hat{\beta}$	3.01					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	3.94	0.886			8824	
	$\hat{b}$	5.91					
Rayleigh			0.005	-812	<1e-6	10444	KS, LRT, and AIC indicate K is the best model.
K	$\hat{\alpha}$	3.57	0.925	55	0.024	8575	
Gamma	$\hat{\alpha}$	2.58	0.921	12	<1e-6	8834	
	$\hat{\beta}$	3.01					

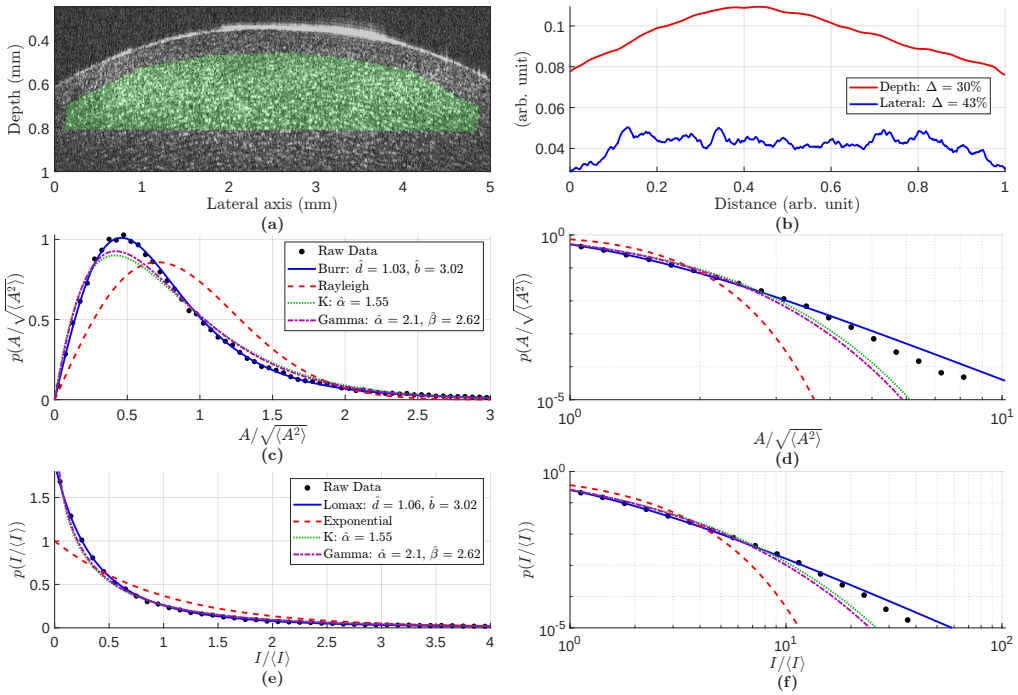

Fig. S6. Pig cornea scanned with 1000 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S6. Parameters and statistics for the pig cornea.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.03	0.958			134916	
	$\hat{b}$	3.02					
Rayleigh			0	-15291	<1e-6	165495	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	1.55	0.391	-963	<1e-6	136840	
Gamma	$\hat{\alpha}$	2.10	0.626	-862	<1e-6	136641	
	$\hat{\beta}$	2.62					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	1.06	0.944			20650	
	$\hat{b}$	3.02					
Rayleigh			0	-41343	<1e-6	103331	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	1.55	0.432	-5272	<1e-6	31193	
Gamma	$\hat{\alpha}$	2.10	0.697	-5984	<1e-6	32619	
	$\hat{\beta}$	2.62					

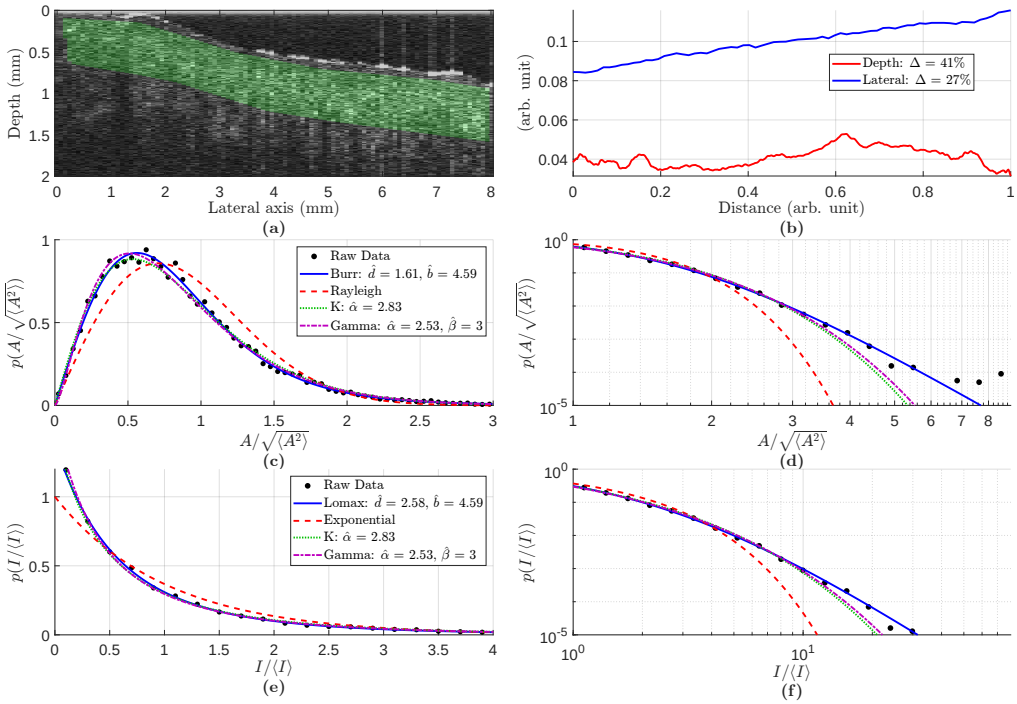

Fig. S7. Excised chicken muscle scanned with 100 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S7. Parameters and statistics for the chicken muscle.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.61	0.952			30196	
	$\hat{b}$	4.59					
Rayleigh			0.001	-1215	<1e-6	32621	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	2.83	0.884	-73	0.00023	30340	
Gamma	$\hat{\alpha}$	2.53	0.899	-59	0.00077	30314	
	$\hat{\beta}$	3.00					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	2.58	0.907			22988	
	$\hat{b}$	4.59					
Rayleigh			0	-28483	<1e-6	79951	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	2.83	0.845	-4438	<1e-6	31863	
Gamma	$\hat{\alpha}$	2.53	0.876	-3718	<1e-6	30425	
	$\hat{\beta}$	3.00					

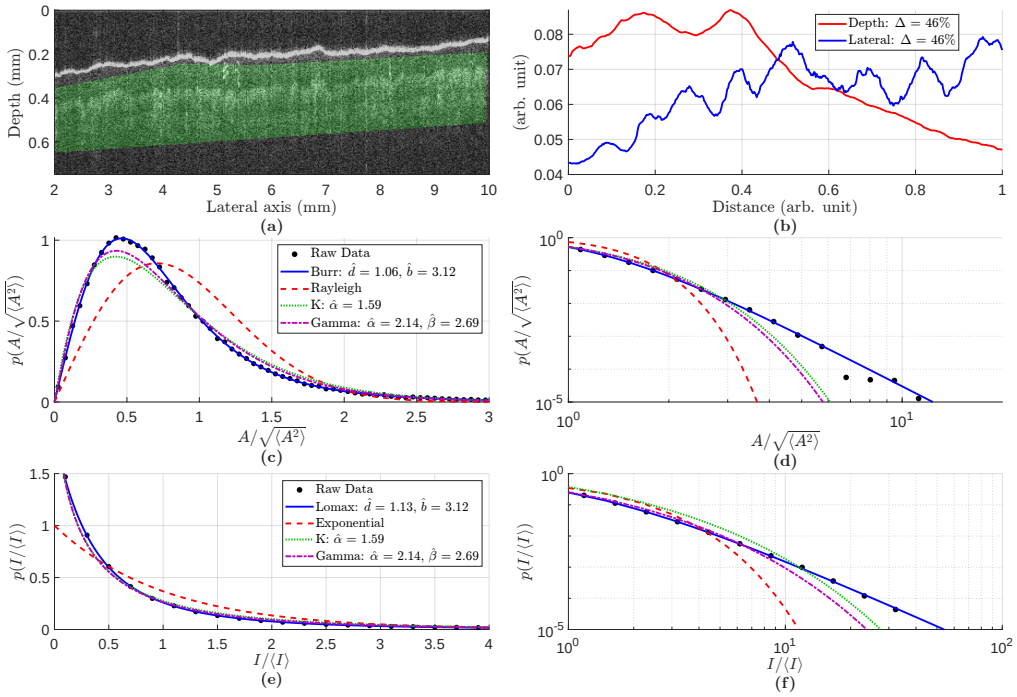

Fig. S8. Human hand (palm) scanned with 1000 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S8. Parameters and statistics for the human hand's palm.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.06	0.894			157194	
	$\hat{b}$	3.12					
Rayleigh			0	-20295	<1e-6	197781	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	1.59	0.129	-1673	<1e-6	160539	
Gamma	$\hat{\alpha}$	2.14	0.438	-1496	<1e-6	160186	
	$\hat{\beta}$	2.69					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	1.13	0.913			33113	
	$\hat{b}$	3.12					
Rayleigh			0	-355891	<1e-6	744890	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	1.59	0.215	-27534	<1e-6	88178	
Gamma	$\hat{\alpha}$	2.14	0.529	-30650	<1e-6	94412	
	$\hat{\beta}$	2.69					

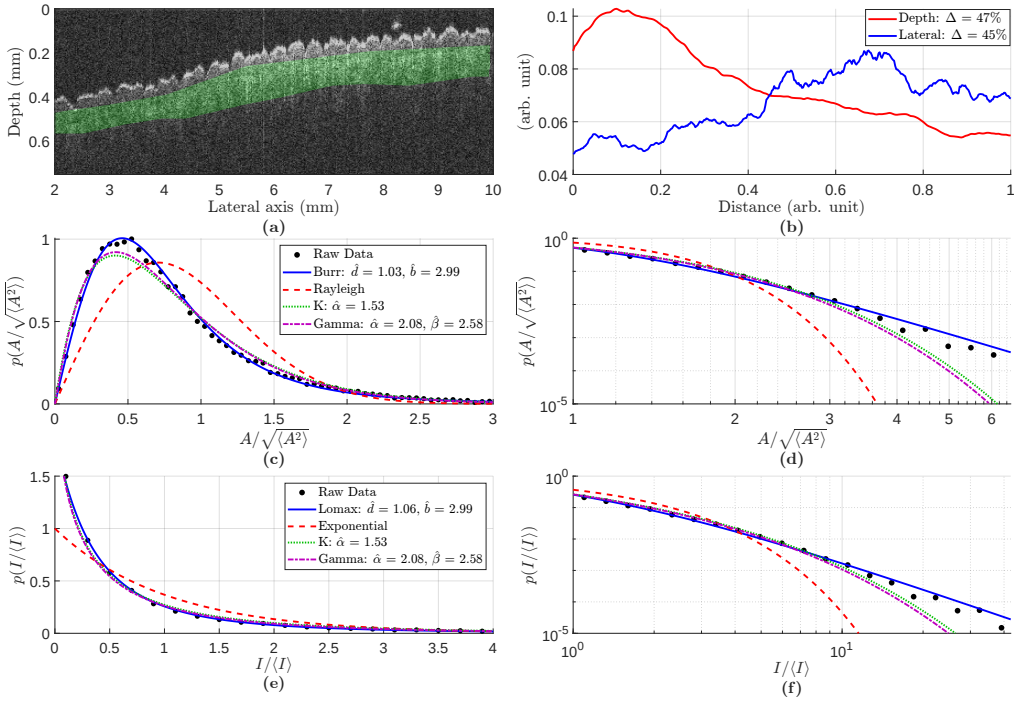

Fig. S9. Human hand (back) scanned with 1000 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S9. Parameters and statistics for the human hand's back.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.03	0.947			58852	
	$\hat{b}$	2.99					
Rayleigh			0	-6090	<1e-6	71028	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	1.53	0.495	-225	<1e-6	59300	
Gamma	$\hat{\alpha}$	2.08	0.730	-197	<1e-6	59246	
	$\hat{\beta}$	2.58					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	1.06	0.863			15550	
	$\hat{b}$	2.99					
Rayleigh			0	-13406	<1e-6	42358	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	1.53	0.446	-1774	<1e-6	19098	
Gamma	$\hat{\alpha}$	2.08	0.516	-2087	<1e-6	19726	
	$\hat{\beta}$	2.58					

Table S10. Summary table of all statistical tests and measures for all tissue samples in order to determine the best distribution. Largest KS p-values and smallest AIC value are highlighted in yellow. Rows for LRT p-values are not shown if all three values were <1e-3. A - Amplitude, I - Intensity.

Sample	Data	Metric	Burr / Lomax	Rayl. / Exp.	K	Gamma	Best Model
5% Gel. Phantom (- Milk)	A	KS p-value	0.964	0	0.449	0.762	Burr
		LRT sign(R)		-	-	-	
		AIC	38823	46432	39614	39499	
	I	KS p-value	0.909	0	0.428	0.720	Lomax
		LRT sign(R)		-	-	-	
		AIC	19255	64787	25540	26278	
5% Gel. Phantom (+ Milk)	A	KS p-value	0.958	0.033	0.924	0.841	Burr
		LRT sign(R)		-	-	-	
		AIC	222575	231145	222850	223528	
	I	KS p-value	0.869	0.002	0.738	0.095	Lomax
		LRT sign(R)		-	-	-	
		AIC	20250	45842	24577	22355	
Mouse Brain	A	KS p-value	0.949	0.075	0.929	0.816	Burr
		LRT sign(R)		-	-	-	
		AIC	91077	94317	91210	91614	
	I	KS p-value	0.851	0.036	0.828	0.662	Lomax
		LRT sign(R)		-	-	-	
		AIC	16400	28956	18389	16906	
Mouse Liver	A	KS p-value	0.957	0.043	0.935	0.879	Burr
		LRT sign(R)		-	-	-	
		LRT p-value		<1e-6	0.091	<1e-6	
		AIC	65863	68220	65898	66131	
	I	KS p-value	0.841	0.004	0.771	0.223	Lomax
		LRT sign(R)		-	-	-	
		AIC	19147	39990	22551	24554	
Pig Brain	A	KS p-value	0.892	0.013	0.943	0.913	K
		LRT sign(R)		-	+	+	
		LRT p-value		<1e-6	<1e-6	0.15	
		AIC	9696	9941	9635	9676	
	I	KS p-value	0.886	0.005	0.925	0.921	K
		LRT sign(R)		-	+	+	
		LRT p-value		<1e-6	0.024	<1e-6	
		AIC	8824	10444	8575	8834	

Pig Cornea	A	KS p-value	0.958	0	0.391	0.626	Burr
		LRT sign(R)		-	-	-	
		AIC	134916	165495	136840	136641	
	I	KS p-value	0.944	0	0.432	0.697	Lomax
		LRT sign(R)		-	-	-	
		AIC	20650	103331	31193	32619	
Chicken Muscle	A	KS p-value	0.952	0.001	0.884	0.899	Burr
		LRT sign(R)		-	-	-	
		AIC	30196	32621	30340	30314	
	I	KS p-value	0.907	0	0.845	0.876	Lomax
		LRT sign(R)		-	-	-	
		AIC	22988	79951	31863	30425	
Human Hand (Palm)	A	KS p-value	0.894	0	0.129	0.438	Burr
		LRT sign(R)		-	-	-	
		AIC	157194	197781	160539	160186	
	I	KS p-value	0.913	0	0.215	0.529	Lomax
		LRT sign(R)		-	-	-	
		AIC	33113	744890	88178	94412	
Human Hand (Back)	A	KS p-value	0.947	0	0.495	0.730	Burr
		LRT sign(R)		-	-	-	
		AIC	58852	71028	59300	59246	
	I	KS p-value	0.863	0	0.446	0.516	Lomax
		LRT sign(R)		-	-	-	
		AIC	15550	42358	19098	19726	

The following three datasets examine the reproducibility of the method in different pig corneas.

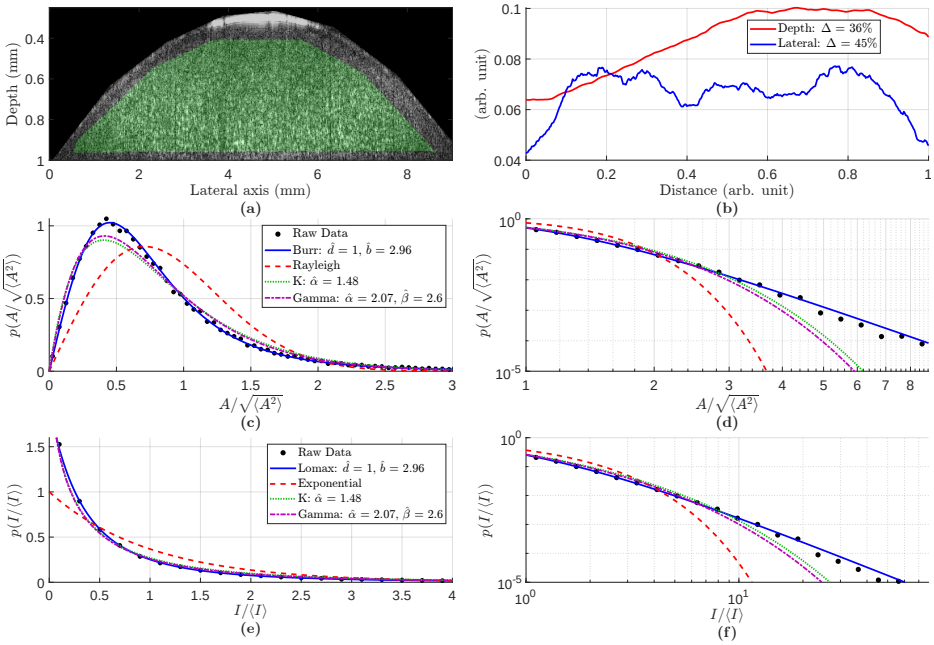

Fig. S10. Extra pig cornea #1 with 500 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S11. Parameters and statistics for the extra pig cornea #1.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.00	0.926			86121	
	$\hat{b}$	2.96					
Rayleigh			0	-11014	<1e-6	108145	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	1.48	0.314	-780	<1e-6	87679	
Gamma	$\hat{\alpha}$	2.07	0.612	-716	<1e-6	87554	
	$\hat{\beta}$	2.60					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	1.00	0.901			18922	
	$\hat{b}$	2.96					
Rayleigh			0	-29449	<1e-6	77816	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	1.48	0.350	-3771	<1e-6	26463	
Gamma	$\hat{\alpha}$	2.07	0.590	-4455	<1e-6	27832	
	$\hat{\beta}$	2.60					

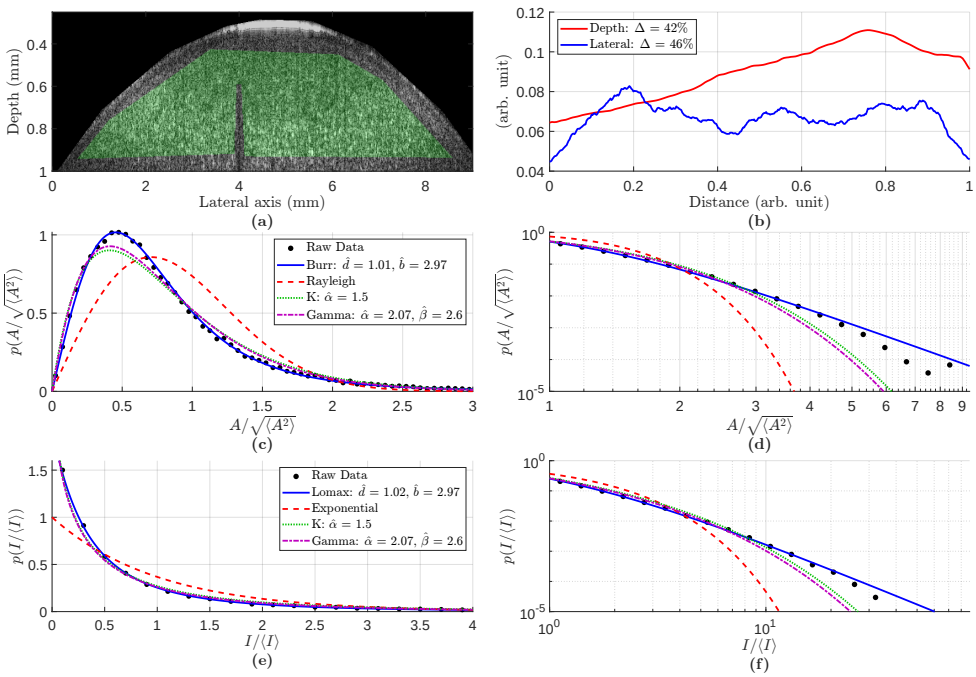

Fig. S11. Extra pig cornea #2 with 500 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S12. Parameters and statistics for the extra pig cornea #2.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.01	0.923			78120	
	$\hat{b}$	2.97					
Rayleigh			0	-9310	<1e-6	96736	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	1.50	0.338	-577	<1e-6	79271	
Gamma	$\hat{\alpha}$	2.07	0.613	-525	<1e-6	79171	
	$\hat{\beta}$	2.60					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	1.02	0.912			19575	
	$\hat{b}$	2.97					
Rayleigh			0	-33967	<1e-6	87508	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	1.50	0.379	-4386	<1e-6	28346	
Gamma	$\hat{\alpha}$	2.07	0.577	-5034	<1e-6	29643	
	$\hat{\beta}$	2.60					

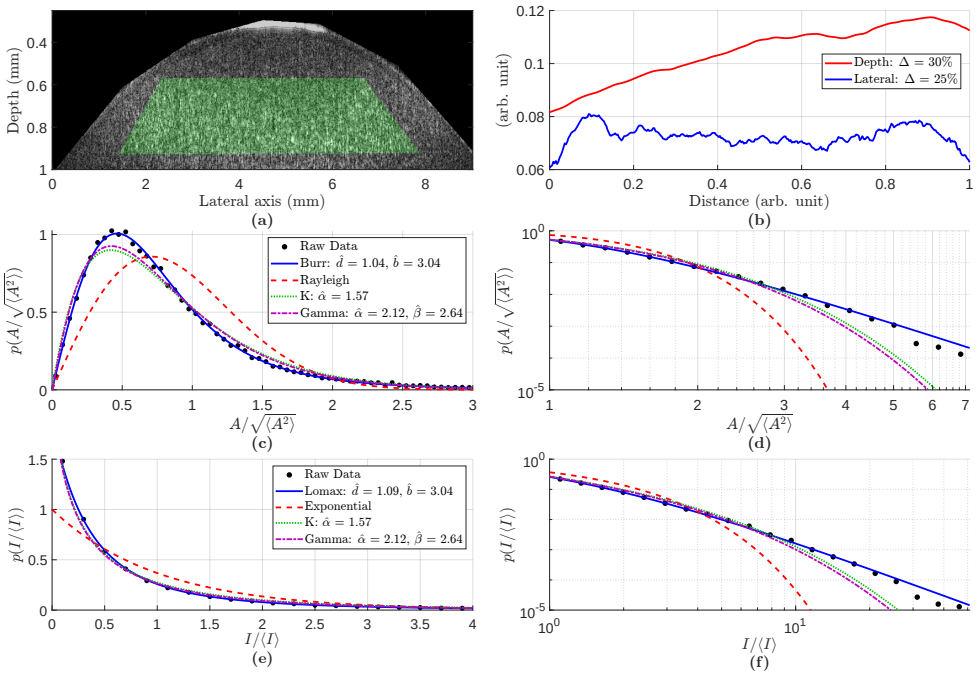

Fig. S12. Extra pig cornea #3 with 500 A-lines. **(a)** Single unfiltered B-mode image with ROI shaded green. **(b)** ROI's normalized spatial integration profiles which do not exceed a Δ of 50%. **(c)** MLE fits to normalized amplitude with the Burr, Rayleigh, K, and Gamma distributions on a linear scale with linear binning. **(d)** Same as part (c) except on a log-log scale with logarithmic binning to visualize tail. **(e)** MLE fits to normalized intensity with the Lomax, Exponential, K, and Gamma distributions on a linear scale with linear binning. **(f)** Same as part (e) except on a log-log scale with logarithmic binning to visualize tail.

Table S13. Parameters and statistics for the extra pig cornea #3.

Amplitude Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Burr	$\hat{d}$	1.04	0.937			54387	
	$\hat{b}$	3.04					
Rayleigh			0	-6015	<1e-6	66412	KS, LRT, and AIC indicate Burr is the best model.
K	$\hat{\alpha}$	1.57	0.413	-395	<1e-6	55174	
Gamma	$\hat{\alpha}$	2.12	0.685	-352	<1e-6	55090	
	$\hat{\beta}$	2.64					
Intensity Distribution	θ	$\hat{\theta}$	KS p-value	LRT R	LRT p-value	AIC	Interpretation
Lomax	$\hat{d}$	1.09	0.931			16698	
	$\hat{b}$	3.04					
Rayleigh			0	-17129	<1e-6	50951	KS, LRT, and AIC indicate Lomax is the best model.
K	$\hat{\alpha}$	1.57	0.453	-2300	<1e-6	21298	
Gamma	$\hat{\alpha}$	2.12	0.598	-2717	<1e-6	22133	
	$\hat{\beta}$	2.64					

Table S14. Summary table of extra pig corneas to demonstrate reproducibility of estimating the exponent parameter $\hat{b}$.

Sample	$\hat{b}$	95% Confidence Interval
Pig Cornea #1	2.96	[2.92, 3.01]
Pig Cornea #2	2.97	[2.92, 3.02]
Pig Cornea #3	3.04	[2.98, 3.10]