Supplementary Information (SI) for RSC Advances.
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Supplementary Information

$LiNbO_3$ and ZnO-Ni Multilayer Thin Films as Hybrid Metamaterials Towards Tunable Properties

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Supporting Information

The supporting information includes the following.

Figure S1: Magnetic data of magnetic moment versus magnetic field for (a)2-ZN, (b)4-ZN, (c)2-LNO, and (d)4-LNO measured at 300K. The inset graph seen in all plots is to show the coercivities.

Table S1: Extracted saturation polarization ($\mathbf{P_{Max}}$) and coercive Field ($\mathbf{E_C}$) from ferroelectric polarization versus electric field (P-E) loops for sample 2-ZN.

Table S2: Extracted saturation polarization ($\mathbf{P_{Max}}$) and coercive Field ($\mathbf{E_C}$) from ferroelectric polarization versus electric field (P-E) loops for sample 4-ZN.

Table S3: Extracted saturation polarization ($\mathbf{P_{Max}}$) and coercive Field ($\mathbf{E_C}$) from ferroelectric polarization versus electric field (P-E) loops for sample 2-LNO.

Table S4: Extracted saturation polarization ($\mathbf{P_{Max}}$) and coercive Field ($\mathbf{E_C}$) from ferroelectric polarization versus electric field (P-E) loops for sample 4-LNO.

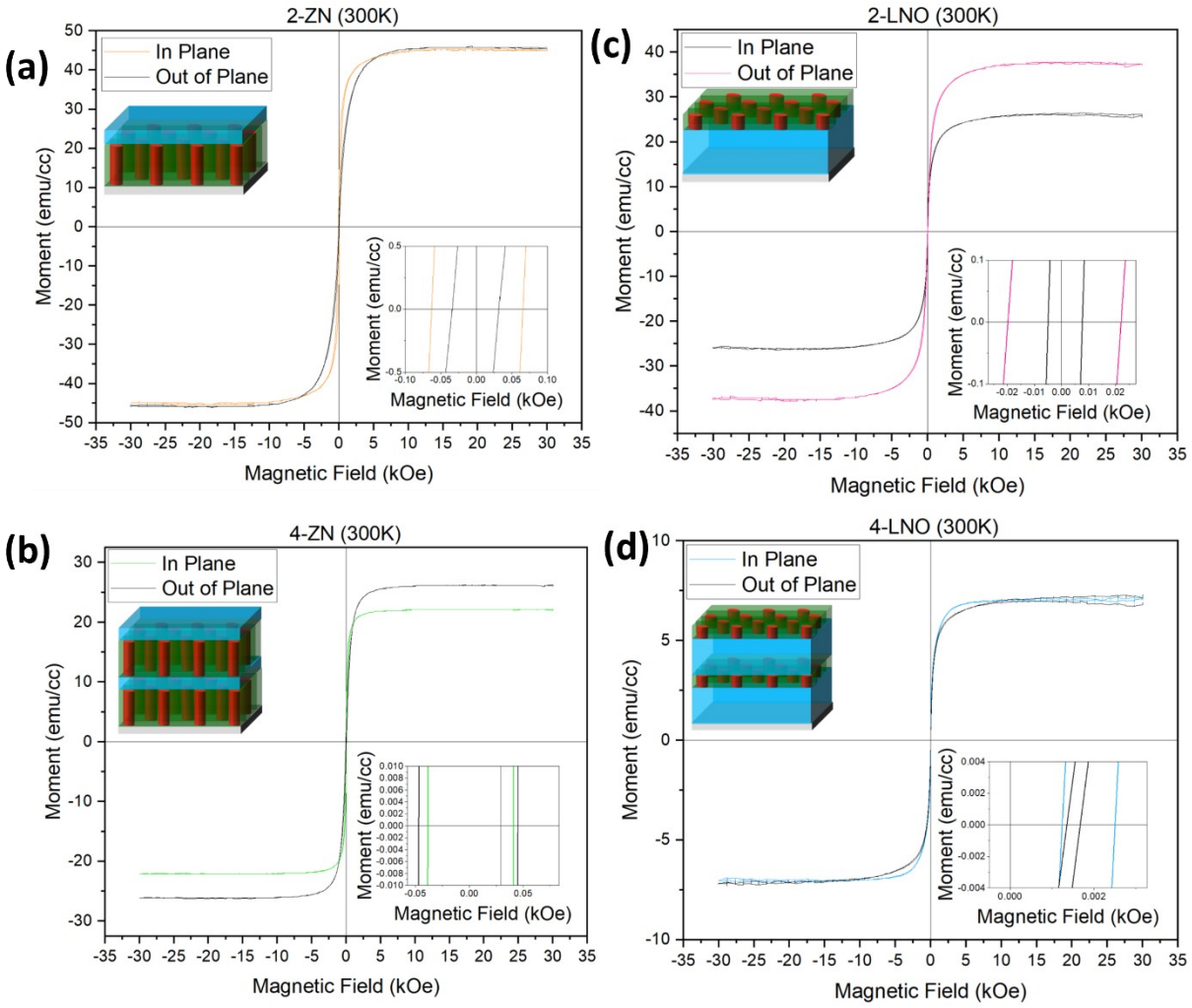

Figure S1: Magnetic data of magnetic moment versus magnetic field for (a)2-ZN, (b)4-ZN, (c)2-LNO, and (d)4-LNO measured at 300K. The inset graph seen in all plots is to show the coercivities.

Table S1: Extracted saturation polarization ($\mathbf{P_{Max}}$) and coercive Field ($\mathbf{E_C}$) from ferroelectric polarization versus electric field (P-E) loops for sample 2-ZN.

2-ZN							
	1V	**2V**	**3V**	**4V**	**5V**	**6V**	**7V**
P_{Max} ($\mu C/cm^2$)	7.76	12.33	24.75	39.28	60.57	72.94	91.09
E_C (kV/cm)	61.87	134.77	240.59	324.23	408.64	528.60	633.42

Table S2: Extracted saturation polarization ($\mathbf{P_{Max}}$) and coercive Field ($\mathbf{E_C}$) from ferroelectric polarization versus electric field (P-E) loops for sample 4-ZN.

4-ZN							
	1V	**5V**	**10V**	**15V**	**20V**	**25V**	**30V**
P_{Max} ($\mu C/cm^2$)	0.0011	0.0047	0.0079	0.013	0.016	0.020	0.026
E_C (kV/cm)	8.48	62.88	157.67	255.00	411.35	557.31	746.06

Table S3: Extracted saturation polarization ($\mathbf{P_{Max}}$) and coercive Field ($\mathbf{E_C}$) from ferroelectric polarization versus electric field (P-E) loops for sample 2-LNO.

2-LNO							
	1V	**5V**	**10V**	**15V**	**20V**	**25V**	**30V**
P_{Max} ($\mu C/cm^2$)	0.39	1.92	3.57	5.03	7.32	10.54	14.21
E_C (kV/cm)	17.50	107.59	278.01	482.40	764.87	1104.08	1435.82

Table S4: Extracted saturation polarization ($\mathbf{P_{Max}}$) and coercive Field ($\mathbf{E_C}$) from ferroelectric polarization versus electric field (P-E) loops for sample 4-LNO.

4-LNO							
	1V	**5V**	**10V**	**15V**	**20V**	**25V**	**30V**
PMax (µC/cm2)	0.0017	0.0069	0.015	0.020	0.027	0.034	0.040
E_C (kV/cm)	20.63	121.95	240.63	345.37	462.03	569.82	693.97