



**SDI Review Form 1.6**

Journal Name:	<a href="#">Physical Science International Journal</a>
Manuscript Number:	Ms_PSIJ_46751
Title of the Manuscript:	DEVELOPMENT OF PARAMAGNETISM ANALYZER
Type of the Article	Original Research Article

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)



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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	<p>1. The values shown for Colpitts oscillator elements and dependencies from 1 to 6 do not match !!! According to assigned values of the composite dimensions are obtained:  <math display="block">R_1 = \frac{9-3.2}{0.87 \cdot 10^{-3}} \approx 6.7 \text{ k}\Omega; \quad R_2 = \frac{3.2 \cdot 10 \cdot 10^3}{9-3.2} \approx 5.5 \text{ k}\Omega \text{ (with your } R_2=10 \text{ k}\Omega);</math> <math display="block">R_E = \frac{3.2-0.7}{270 \cdot 0.87 \cdot 10^{-3}} \approx 10.6 \Omega; \quad R_B = \text{new value};</math> Stability factor - enter a dimension; with your values = 5,66. Not 10. Calculate and choose the value of <math>C_E</math>.</p> <p>Row 146 - Resistors have dimension <math>\Omega</math> !</p> <p>2. Row 112 - The <b>collector</b> terminal .... The <b>emitter</b> is not connected to the oscillatory circuit !</p> <p>3. In Fig. 5 the values of Colpitts oscillator elements are different - resistors, capacitors and inductance !!! This is incorrect. In rows 152 and 153 dimensions have different inductance and capacitors. With values of fig. 5 <math>f_T=1,990</math> MHz.</p> <p>4. According to assigned values of the composite dimensions are obtained - row 172:  <math display="block">R_8(\text{not } R_6) = \frac{9-0.7}{4.3 \cdot 10^{-6}} \approx 1.93 \text{ M}\Omega; \quad R_9(\text{not } R_7) = \frac{9-4.5}{270 \cdot 4.3 \cdot 10^{-6}} \approx 3.88 \text{ k}\Omega.</math></p> <p>5. Why and how it gets <math>U_{CC}</math> of transistor Q2 5 V (fig. 3)? The common <math>U_{CC}=9</math> V.</p>	<p>1. <math>V_B = 3.2 \text{ V}</math>, <math>I_B = 0.87 \text{ mA}</math>, <math>V_{CC} = 9 \text{ V}</math> Assuming <math>I_C \approx I_E</math>  <math display="block">V_E = 10\% V_{CC}, \quad I_E = \beta I_B</math> The biasing resistors were obtained using the following expressions:</p> $R_1 = \frac{V_{CC} - V_B}{I_B} = \frac{9 - 3.2}{0.87 \times 10^{-3}} \approx 6.7 \text{ k}\Omega$ $R_2 = \frac{V_E R_1}{V_{CC} - V_B} = \frac{3.2 - 6.7 \times 10^3}{9 - 3.2} \approx 3.7 \text{ k}\Omega$ $R_E = \frac{V_B - V_{BE}}{I_E} = \frac{V_B - V_{BE}}{\beta I_B} = \frac{3.2 - 0.7}{270 \times 0.87 \times 10^{-3}} = 10.6 \Omega$ $R_B = R_1 // R_2 \approx 2.4 \text{ k}\Omega$ $C_E = \frac{1}{2\pi f_T X_C} = \frac{1}{2\pi f_T \left( \frac{1}{10\Omega R_E} \right)} = \frac{1}{2\pi \times 2 \times 10^3 \times 1.06} \approx 0.08 \mu\text{F}$ <p>2. The collector terminal and the junction of the two capacitors are both grounded.  3. That is true, the corrections had been effected.  4. That is true; correction effected.  <math display="block">I_B = 4.3 \mu\text{A}, \beta = 270, V_E = \frac{1}{10} V_{CC} = 4.5 \text{ V}, V_{CC} = 9 \text{ V}</math> <math display="block">R_8 = \frac{V_{CC} - 0.7 \text{ V}}{I_B}</math> <math display="block">R_7 = \frac{V_{CC} - V_E}{\beta I_B}</math> <p>Where <math>I_C = \beta I_B</math>  The required value of <math>R_8</math> and <math>R_7</math> are <math>1.90 \text{ M}\Omega</math> and <math>3.90 \text{ k}\Omega</math> respectively.</p> <p>5. Truly the common <math>V_{CC} = 9 \text{ V}</math>. The <math>5 \text{ V}</math> was tapped from the microcontroller board to power the emitter follower circuit.</p> </p>
Minor REVISION comments	<p>1. The volume (content) of the Abstract is very large. Part of its content could be in the Conclusion. The text is not aligned on the right.</p> <p>2. There are different ways of writing the "Colpitts oscillator" - please use "Colpitts oscillator" always.</p> <p>3. Please, add in the title of Fig. 1 - Proposed Complete ....</p> <p>4. Figures 2, 3 and 4 are different in appearance. Please, present them with a program product. Rewrite the title of Fig. 2.</p> <p>5. Row 150 - number of equation - only 9. May be numbers of equations are in ( ).</p>	<p>1. One of the quantities of fundamental importance in describing magnetic phenomena and materials is the magnetic moment. This research focused on the development of a paramagnetic materials analyzer using locally sourced materials to determine magnetic moment of magnetic materials. This involves the design of a sensing unit. The sensing unit comprised of a colpitt oscillator, preamplifier and shaping circuit, K – type thermocouple sensor, thermocouple amplifier, microcontroller, matrix keypad and a LCD. The developed instrument was calibrated using a known standard magnetic moment value of iron. The instrument was tested and it was able to determine the magnetic moment of available magnetic materials with a standard deviation of <math>0.0163 \pm 0.005</math>. The value of magnetic moment obtained for the available known materials fall within the range of values obtained from literature.</p> <p>2. Correction effected  3. Correction effected  4. Correction effected  5. Correction effected</p>



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	<p>6. In Fig. 4 you have to put nodes where they are.</p> <p>7. In table 1 I calculate the Error for 1.6MHz 0.002153, and for 1.7MHz - 0,00707. Please, check the calculations.</p> <p>8. Please add a text before table 4.</p>	<p>6. Correction effected</p> <p>7. Correction effected</p> <p>8. The table below shows the measured magnetic moment values taken by the developed instrument in comparison with the standard magnetic moment values of the materials under consideration.</p>
<b>Optional/General</b> comments	<p>1. It would be a good idea References to be numbered and quoted in the representation.</p>	<ol style="list-style-type: none"> <li>1. Chiou Lawrence and Christopher Williams; <i>Magnetic moment</i>. Brilliant.org. Retrieved 15:49, August 15, 2017 from <a href="https://brilliant.org/wiki/magnetic-moment/">https://brilliant.org/wiki/magnetic-moment/</a>.</li> <li>2. Laurent S. et al; MRI Contrast Agents: From Molecules to Particles. Springer Singapore, 2017. p 5</li> <li>3. Hoon, S. R.; An inexpensive, sensitive vibrating sample magnetometer. <i>The Institute of Physics and the European Physical Society</i>. 1983 Vol. 4, 61 – 62</li> <li>4. Fagaly . R. L; SQUID Instruments and Applications. Tristan Technologies, San Diego, CA 92121, USA. p. 3</li> <li>5. Foner, S.; Versatile and Sensitive vibrating Sample Magnetometer. <i>Rev. Sci. Instrum.</i>, 1956 30(7), 546 – 557.</li> <li>6. Niazi A. et al; A Precision, Low Cost Vibrating Sample Magnetometer. <i>Current Science – Bangalore</i>, 2000 79 (1) 99 – 109.</li> <li>7. Wesley B. et al; A Simple Vibrating Sample Magnetometer for Use in a Material Physics Course. <i>American Journal of Physics</i>, 2003 71 (8).</li> <li>8. Syed Alamdar H. S; Vibrating Sample Magnetometry: Analysis and Construction. Department of Physics, Syed Babar Ali School of Science &amp; Engineering, LUMS, 2013.</li> <li>9. Pattnaik . D. P.; Design and Fabrication of Vibrating Sample Magnetometer. Department of Physics and Astronomy, National Institute of Technology, Rourkela 769008, Odisha, India, 2014.</li> <li>10. Magnetism is Transition Metals complexes; retrieve from <a href="https://web.unic.ca/djberg/Chem324-12.pdf">https://web.unic.ca/djberg/Chem324-12.pdf</a> retrieve on 12th February, 2017, 3:22 pm.</li> </ol>

**PART 2:**

	<b>Reviewer's comment</b>	<b>Author's comment</b> (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<b>Are there ethical issues in this manuscript?</b>	(If yes, Kindly please write down the ethical issues here in details)	