

The **Model Summary** agrees with the Analysis of variance result. From this summary table, it can be seen that the fitted regression model explains about 92.36% ($R^2 = 92.36\%$) of the total variability in the data, leaving only 7.64% for error. This agrees perfectly with the Analysis of Variance Table above, indicating that the fitted regression model fits the data well.

$$\text{AVG Irradiance (W/m}^2\text{)} = 387 - 2.98 \text{ AVG_AMB_TEMP_MDG} - 1.915 \text{ AVG_REL_HUMIDITY_MDG} \\ + 9.10 \text{ AVG_S/SHINE_HRS_MDG}$$

4. Conclusions – These analyses show that average irradiance of Maiduguri is 10.9% and 21.8% higher than that of Minna and Port Harcourt respectively. These are vital to the design of solar PV energy conversion system. The available solar irradiance in the three locations studied shows that the development of solar PV system for energy conversion is viable but better in Maiduguri than the other two locations.

ACKNOWLEDGEMENT

The authors wish to thank the Petroleum Technology Development Fund, Abuja, Nigeria for the sponsorship, College of Education, Minna for Study Fellowship and the Cranfield University, UK for the facilities.

5. References

- [1] Abreu, E. F. M., Canhoto, P., Prior, V., & Melicio, R. *Renewable Energy*, **127**, (2018) p. 398–41 [2] Moreno-Tejera, S., Silva-Pérez, M. A., Lillo-Bravo, I., & Ramírez-Santigosa, L. *Solar Energy*, **132**, (2016). P. 430–441.
- [3] Gueymard, C. A., & Wilcox, S. M. (2011). Assessment of spatial and temporal variability in the US solar resource from radiometric measurements and predictions from models using ground-based or satellite data. *Solar Energy*, *85*(5), 1068–1084
- [4] Journée, M., Müller, R., & Bertrand, C. (2012). Solar resource assessment in the Benelux by merging Meteosat-derived climate data and ground measurements. *Solar Energy*, *86*(12), 3561–3574.
- [5] Moreno-Tejera, S., Silva-Pérez, M. A., Lillo-Bravo, I., & Ramírez-Santigosa, L. (2016). Solar resource assessment in Seville, Spain. Statistical characterisation of solar radiation at different time resolutions. *Solar Energy*, *132*, 430–441
- [6] Abam, F.I., Nwankwojike, B.N., Ohunakin, O.S. et al. *Int J Energy Environ Eng* (2014) 5: 102