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A resistance thermometer for the low millikelvin temperatures NODAR SAMKHARADZE, ASHWANI KUMAR, GABOR CSATHY, Purdue University — Resistance thermometers, while being easy to use, are known be unreliable below a few tens of mK. It is thought that unintentionally applied power coming from a ground loop or radio frequency signals reaching the thermometer will heat up the sensing element or cause temporal fluctuations in the temperature and hence the resistance. We built a thermometer based on a carbon composition resistor that has an unusually good thermal contact with its environment, which makes it immune to heating by spurious power. Therefore we think that it will be useful for routine resistive thermometry below 10mK. In addition our thermometer has a few other desirable properties: it can be used to measure from a few millikelvin all the way to room temperature and the carbon resistor sensor is commercially available.

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