

Research about the high precision temperature measurement

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High precision temperature control system is one of most important support conditions for tunable birefringent filter. As the first step, we researched some high precision temperature measurement methods for it. Firstly, circuits with a 24 bit ADC as the sensor's reader were carefully designed; Secondly, an ARM processor is used as the control processing unit, it provides sufficient reading and processing ability; Thirdly, three kinds of sensors, PT100, Dale 01T1002-5 thermistor, Wheatstone bridge (constructed by pure copper and manganin) as the sensor of the temperature were tested respectively. The resolution of the measurement with these three kinds of sensors are all better than 0.001°C , that's enough for 0.01°C stability temperature control. Comparatively, Dale 01T1002-5 thermistor could get the most accurate temperature of the key point, Wheatstone bridge could get the most accurate mean temperature of the whole layer, both of them will be used in our future temperature control system.