frequently been a severe problem in high-pressure thermocouples use, particularly above ~700°C for Chromel–Alumel and above ~1300°C for Pt–Pt10Rh in this and other work in this laboratory. Hanneman *et al.*[2,11] report similar findings. These effects can often be larger than the pressure effect itself.

In order to apply these corrections at all, pressure seal temperatures must be measured. For previous experiments without this information, estimates would have to be made.

The corrections for Pt–Pt10Rh are considerably smaller than previous values. At the extremes of the explored region, 35 kbar and 1000°C, our results are just half the estimates of Hanneman *et al.*[2,11] This relation also holds for our extrapolated values to the extremes of their estimates, 50 kbar and 1200°C. The values of Wentorf[14] are approximately 20% greater than those of Hanneman *et al.* in this region.

The initial slopes of our correction curves for Pt–Pt10Rh are very similar to those of Hanneman *et al.*[2,11] The discrepancy at high pressure and temperature arises from a greater curvature in our correction curves with both pressure and temperature.

For Chromel–Alumel the corrections are particularly small and insensitive to pressure and temperature in the temperature range where Chromel–Alumel is highly reliable, below ~700°C. Above that the correction curves take on large negative slopes leading to quite large negative corrections. This is in contrast to the values of Hanneman *et al.*[2,11] which are also small at lower temperatures, but remain positive to 1200°C.

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Basis for Picosecond Structure in Mode-Locked Laser Pulses

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In careful experimental measurements of mode-locked laser pulses, using nonlinear media, a number of workers have found evidence for what appear to be coexisting subpicosecond pulses, and pulses in the range of 10–40 psec. In this letter we describe a model of a light pulse in which a Gaussian random-radiation field (i.e., a thermal field) of limited spectral extent is modulated by a temporal pulse envelope, and we show that predictions based on such a model are in excellent detailed agreement with published experimental results. We also consider the case of a pulse of linearly chirped radiation, and show that a clear distinction can be made between this case and a pulse of Gaussian random radiation.

The role of coherence in determining contrast ratios in the two-photon fluorescence measurements of picosecond light pulses has been understood for some time.[1–4] Coherence considerations are also important in methods which use interacting orthogonal polarizations in second- or third-harmonic generating media, although in these cases the background level is absent and the question of contrast does not arise. In this paper we calculate the exposures $\mathcal{E}(\tau)$, resulting when a radiation field is divided into two equal portions and then recombined, with an adjustable delay τ, in a medium which produces a signal proportional to either the square or cube of the fundamental intensity. Three specific cases of interest are two-photon fluorescence, second-harmonic generation, and third-harmonic generation. In carrying out our calculations we will use two models for the radiation field: I, a pulse of spectrally filtered thermal radiation, and II, a coherent pulse whose frequency changes linearly with time (linear chirp). Steady-state thermal radiation and a single coherent pulse (without chirp) appear as limiting cases of I or II.