The interaction of intense ultrashort laser pulses with materials in the strong field regime of nonlinear optics enables the study of electron excitations with high temporal resolution. In this thesis, we focus on the experimental research of high harmonic generation in crystalline silicon. The goal of our study is to reach the modulation of the amplitude and the phase of the generated field using coherence control by a superposition of optical fields at the fundamental and its third harmonic frequency. The modulation of the generated field occurs due to the change of the relative phase shift between the driving fields. The resulting amplitude and phase changes of the high harmonic field are investigated for different amplitude ratios of the driving fields using spectroscopic methods and spectral interferometry. The newly introduced spectral interferometry technique enables the measurement of the emission delay of high-energy photons on attosecond time scale.