STIR stands for Short-TI Inversion Recovery and is typically used to null the signal from fat. At 1.5T fat has a T1 value of approximately 260 ms, so its TInull value is approximately 0.69 x 250 = 180 ms. The optimal value is often slightly less than this for two reasons: 1) adipose tissues contain variable amounts of water, and 2) a fast spin echo signal acquisition method is commonly used which includes the application of additional 180°-pulses and gradients. As such typical practical values of TI for STIR at 1.5T are in the 160-180 range.

The fat suppression possible by STIR is generally uniform and relatively independent of magnetic field inhomogeneities. STIR may be superior to other fat saturation methods (such as spectral “fat-sat”) especially near metallic foreign bodies, near tissue interfaces with high susceptibility differences (like the skull base/sinuses), and across large body parts (such as the abdomen and pelvis). It is even possible to perform whole-body STIR imaging as a screening technique for bone metastases. In lower field permanent magnet scanners with relatively poor homogeneity, STIR is one of the only fat suppression methods available.