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The design and simulation of a new experimental set up for measuring short nuclear level lifetimes.

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Abstract content
 (Max 300 words)
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Special chars

Measurements of nuclear level lifetimes play an important role in studies nuclear astrophysics. The lifetime of a state is related to its gamma width and therefore impacts the rates of resonant capture reactions in stars. This provides a constraint on models of stellar evolution. Lifetime measurements can also be used to investigate nuclear structure. The lifetime is directly related to the

transition strengths to other states. The transition strengths are related to the transition matrix elements connecting states. In this regard measuring lifetimes is a useful complementary to technique to Coulomb excitation for measuring quadrupole moments.

In this talk I discuss the design and simulation of a new experimental set up at iThemba LABS to be used for measuring short lifetimes with the Doppler shift attenuation method in inverse kinematics. The design was done using the Solid Edge software package for computer assisted design (CAD), with a particular focus on providing the cleanest possible environment in which the

experiments can be conducted. I will also give an overview of the codes developed to simulate the set up. Preliminary results of gamma ray lineshapes using Geant4 simulations will be presented.

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and his / her institution

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