Identification of a Dipole Band above the $31/2^-$ isomeric state in ^{189}Pb first observed at the Australian National University.

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A dipole band of six transitions built upon a firmly established $31/2^-$ isomeric state has been identified in ^{189}Pb using recoil-isomer tagging at the University of Jyväskylä, Finland. The 32μs isomeric state was first observed at the Australian National University [1,2]. This is the lightest odd-mass Pb nucleus in which a dipole band has been established to date. The dipole nature of the new transitions has been confirmed through angular-intensity arguments and conversion coefficient analysis.

The evolution of the excitation energy and the aligned angular momentum of the states in the new dipole band are compared with those of the dipole bands in the heavier mass lead isotopes. This comparison suggests that the configuration of the new band in ^{189}Pb is based upon a $\pi[s^{-2}_{1/2}h_{9/2}i_{13/2}]_{11-}\otimes\nu[i^{-1}_{13/2}+]$ configuration. However, increases in the aligned angular momentum at low rotational frequencies in ^{189}Pb, and perhaps in ^{191}Pb, relative to the higher-mass isotopes may suggest that the lighter-mass dipole band heads are subject to a smaller repulsive proton / neutron-hole interaction.

Prof. Dracoulis was a part of this collaboration but was unfortunately unable to participate in the experiment in Finland. I was fortunately able to discuss the results with him on my last visit to the Australian National University. These results have just been submitted to Physics Review C for publication (May 2015).

[1] A. M. Baxter et al., Phys. Rev. C **71**, 054302 (2005).
[2] G.D. Dracoulis et al., Physical Review C **79**, 031302(R) (2009)