Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Spin Coulomb drag and optical excitations in low dimensional systems IRENE D'AMICO, University of York, CARSTEN ULLRICH[1], University of Missouri — Within the remit of new quantum technologies, an intense effort is devoted to improving our understanding of spin dynamics, with the aim of building novel spintronics devices. In this context the theory of spin Coulomb drag (SCD) was recently developed. It shows that Coulomb interactions are an intrinsic decay mechanism for spin currents. As confirmed by experiments, SCD can be substantial in semiconductors, and it is bound to become one of the most serious issues in spin polarized transport, since, due to its intrinsic nature, it cannot be avoided even in the purest material. More recently the influence of SCD on optical spin-injection and spin-resolved optical experiments has been considered. Here we report on SCD effects on intersubband optical spin excitations in III-V quantum wells, where SCD may contribute substantially to the linewidth of spin plasmons. By going beyond the usual local density functional approximation and properly including the effects due to the inhomogeneity of the system in the growth direction, we show that the quantization of states in the growth direction may strongly reduce the intrinsic plasmon linewidth.

[1]Supported by DOE Grant DE-FG02-05ER46213.

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Date submitted: 11 Nov 2011 Electronic form version 1.4