

On generalised Wintgen ideal Legendrian submanifolds

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For all submanifolds M^n of all real space forms $\tilde{M}^{n+m}(c)$ with constant sectional curvature c , for all dimensions $n \geq 2$ and for all co-dimensions $m \geq 1$, the so-called *Wintgen inequality* was conjectured by De Smet, Dillen, Verstraelen and Vrancken (1999). The conjecture, also known as the DDVV conjecture, was proven by Ge and Tang (2008) and by Lu (2011), independently. I. Mihai obtained the Wintgen inequality, also known as the *generalised Wintgen inequality*, for Lagrangian submanifolds in complex space forms (2014) as well as for Legendrian submanifolds in Sasakian space forms (2015), and also characterised the corresponding equality cases. Submanifolds M which satisfy the equality in these optimal general inequalities are called *generalised Wintgen ideal submanifolds* in the ambient space \tilde{M} . For *generalised Wintgen ideal Legendrian submanifolds* M^n of Sasakian space forms $\tilde{M}^{2m+1}(c)$, in the present article, we will show some properties concerning their *Deszcz symmetry* and their *Roter type*. We also show that for such generalised Wintgen ideal Legendrian submanifolds, the (intrinsic) *Ricci principal directions* and the (extrinsic) *Casorati principal directions* coincide.
