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Injection and control of Frequency Dependent Squeezing in Advance Virgo Plus (invited)

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The injection of phase-squeezed vacuum states, in ground based gravitational wave detectors, already demonstrated its efficiency during the last observative run by reducing quantum noise of about 3 dB, above 100 Hz. At this stage, the consequent increase of quantum noise below this frequency, due to the anti-squeezed amplitude quadrature, did not affect the detector sensitivity, being this covered by technical noises.

In view of the next observative run, these noises will be drastically reduced. One of the challenge to face, in order to fullfill the new sensitivity requirments, is a broad-band quantum noise reduction. The adopted strategy is to use frequency dependent squeezing technique, based on filter cavity.

In this talk, the conceptual design, the adopted control strategy and the status of the installation of this technique for Advanced Virgo Plus will be presented.

Primary authors: Dr SEQUINO, Valeria (Università degli Studi di Napoli "Federico II" and INFN sez. Napoli); Dr VARDARO, Marco (Institute for High-Energy Physics, University of Amsterdam and NikHef)

Presenters: Dr SEQUINO, Valeria (Università degli Studi di Napoli "Federico II" and INFN sez. Napoli); Dr VARDARO, Marco (Institute for High-Energy Physics, University of Amsterdam and NikHef)

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