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Emittance Pressure Dominated Regimes for Resonant PWFA Experiments at SPARC Lab ALBERTO MAROCCHINO, STEFANO ATZENI, dipartimento SBAI “La Sapienza” Roma, ENRICA CHIADRONI, MASSIMO FERRARIO, CLAUDIO GATTI, PASQUALE LONDRILLO, INFN Italy, ANDREA MOSTACCI, dipartimento SBAI “La Sapienza” Roma, FRANCESCO MASSIMO, INFN Italy, LUIGI PALUMBO, dipartimento SBAI “La Sapienza” Roma, ANDREA ROSSI, INFN Italy, STEFANO SINIGARDI, Universita’ Bologna Italy — Considerable interest has been shown in the last few years in compact plasma accelerators characterized by extremely high accelerating gradients generated, e.g., by high brightness particle beams. PWFA is currently under investigation at SPARC Lab test facility (Frascati, Italy). Despite 1D model are too simple and limited to catch the whole underlying physics, they offer a simple and fast tool to assess possible working points. We discuss how these models can be analytically modified to extend their validity in the quasi-non-linear regime to phenomenologically account for damping effects. We also present 3D PIC simulations for emittance pressure dominated regimes. We discuss how elongated bunch, with a transverse dimension smaller than the longitudinal dimension, suffer from being drawn into the self-generated bubble and seed the two-stream instability in the witness bunch. A possible mechanism to reduce such an effect consists in using emittance-dominated bunch that can contrast the self-focusing force produced by the surrounding bubble.

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