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(19) **United States**(12) **Patent Application Publication**  
**Nielsen**(10) **Pub. No.: US 2022/0376670 A1**(43) **Pub. Date: Nov. 24, 2022**(54) **PHASE NOISE REDUCTION IN A VARIABLE  
ANALOGUE RF RESONATOR WITH  
SWITCHED CAPACITORS**(71) Applicant: **Anlotek Limited**, London (GB)(72) Inventor: **Jorgen Staal Nielsen**, Calgary (CA)(21) Appl. No.: **17/733,936**(22) Filed: **Apr. 29, 2022****Related U.S. Application Data**(60) Provisional application No. 63/182,650, filed on Apr.  
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CPC ..... **H03H 7/00** (2013.01)(57) **ABSTRACT**

An active feedback RF resonator has a signal loop having a signal input and a signal output. The signal loop has a variable gain stage and at least one variable resonator, each variable resonator comprising an inductance element and a variable capacitance element comprising a number of switched fixed value capacitors and a variable capacitor. A phase noise of the active feedback RF signal has a maximum value for an operating frequency of the variable resonator that is based on an operating range of the variable capacitor.

